

**BIOLOGICAL IMPACTS****CHAPTER 5**

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The National Environmental Policy Act (NEPA) requires that an environmental impact statement for a proposed Federal action evaluate the impacts of the action with respect to the human environment, including its biological, economic, and social components. This chapter addresses the first of these dimensions, evaluating the impact of potential modifications to the Atlantic Large Whale Take Reduction Plan (ALWTRP) on the biological environment.<sup>1</sup> Of foremost concern to this evaluation is the direct effect of the potential regulations on the likelihood that North Atlantic right whales, humpback whales, and fin whales – all of which are federally listed endangered species – will be killed or seriously injured as a result of entanglement in commercial fishing gear. It is also necessary, however, to consider whether new regulations could indirectly affect these species by exposing them to different risks or by altering the habitat upon which they depend. In addition, it is important to consider the potential effect that changes in ALWTRP regulations might have on other aspects of the marine environment.

The discussion that follows presents an evaluation of these impacts. It focuses first on the potential direct and indirect effects of revised ALWTRP regulations on Atlantic large whales, comparing the potential impacts of each of the regulatory alternatives under consideration, one of which NMFS may ultimately choose to identify in the FEIS (Section 5.1). It then discusses other potential impacts on marine resources, including impacts on other protected species, directed catch, bycatch, and essential fish habitat.<sup>2</sup> These other potential impacts are compared among the regulatory alternatives under consideration (Section 5.2). The chapter is organized as follows:

- Section 5.1.1 presents the potential direct and indirect effects of gear modification requirement changes on Atlantic large whales,
- Section 5.1.2 presents the potential direct and indirect effects of changes to restricted times and areas on Atlantic large whales,
- Section 5.1.3 provides a comparison of biological impacts across regulatory alternatives under consideration on Atlantic large whales,
- Section 5.2.1 presents a discussion of impacts of regulatory alternatives under consideration to other protected species,

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<sup>1</sup> Chapters 6 and 7 evaluate impacts on the economic and social environment, respectively.

<sup>2</sup> In this context, directed catch refers to the catch of species that are the target of commercial fishing effort. Bycatch refers to fish that are harvested but not sold or kept for personal use, including fish that are released because they are not profitable to sell (economic discards) and fish that are released due to catch limits (regulatory discards).

- Section 5.2.2 presents a discussion of impacts of regulatory alternatives under consideration to essential fish habitat,
- Section 5.2.3 presents a discussion of impacts of regulatory alternatives under consideration to directed catch and bycatch, and
- Section 5.2.4 provides a comparison of other potential impacts, excluding those on Atlantic large whales, among regulatory alternatives under consideration.

## 5.1 IMPACTS TO ATLANTIC LARGE WHALES

The primary threat that commercial fishing poses to Atlantic large whales is the risk of incidental entanglement in commercial fishing gear. As noted in Chapter 2, such entanglement can cause serious injury or death. The regulatory changes under consideration are designed to reduce harm to large whales by reducing the likelihood of entanglement and/or reducing the severity of an entanglement should one occur. NMFS seeks to achieve these objectives through a combination of two general measures:

- gear modification requirements; and
- restrictions on fishing activity at specified locations and times.

The discussion below examines the impact of these measures on whale entanglement risks, beginning with an evaluation of specific gear modification requirements, then turning to an assessment of other restrictions.<sup>3</sup> It is important to note that the No Action Alternative (Alternative 1) would not achieve the objectives listed above. If Alternative 1 were implemented, there would likely be additional incidents of serious injury and mortality to large whales due to entanglement in commercial fishing gear rather than a reduction in these interactions. Factors such as serious injury and mortality due to commercial fishing impedes the right whale population's ability to recover (Reeves et al., 2001).

The evaluation of the impact of regulatory changes on whale entanglement risks is largely qualitative. This approach is necessary because models that would enable NMFS to conduct a rigorous quantitative assessment of such risks are currently unavailable. To the extent possible, however, the evaluation takes into account quantitative indicators of the impact of alternative regulations. These indicators do not measure changes in entanglement risks, but offer useful information on factors that may partially correlate with such risks. These indicators are presented at the conclusion of the discussion.

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<sup>3</sup> The ALWTRP is designed to reduce the risk of serious injury and mortality of strategic stocks of North Atlantic right, humpback, and fin whales as a result of interactions with commercial fishing gear. Although it is not listed as endangered or threatened under the Endangered Species Act, the minke whale (*Balaenoptera acutorostrata*) is protected under the Marine Mammal Protection Act. Due to similarities in distribution, feeding behavior, and other characteristics, minke whales are believed to benefit from ALWTRP measures in much the same manner as the species the plan is designed to protect. Thus, the discussion of impacts to Atlantic large whales applies to minke whales as well as to North Atlantic right whales, humpback whales, and fin whales.

### 5.1.1 Impacts of Gear Modification Requirements

The requirements proposed under each regulatory alternative vary by fishery. Exhibits 5-1 through 5-4 summarize the gear modification requirements specified by Alternatives 2 through 6, focusing in turn on the lobster trap/pot fishery, other trap/pot fisheries, Northeast and Mid-Atlantic gillnet fisheries, Southeast Atlantic gillnet fishery, and Southeastern U.S. Atlantic shark gillnet fishery. Exhibits 5-5 and 5-6 summarize additional requirements that would apply to driftnet gear in the Northeast and Mid-Atlantic, and to gillnet and shark gillnet gear in the Southeast Atlantic.<sup>4</sup> In each exhibit:

- Solid circles identify modifications that would be newly required.
- Hollow circles identify cases in which a regulatory alternative would eliminate or relax existing ALWTRP measures.
- Shaded cells identify cases in which the ALWTRP had previously established gear modification requirements. Unless specifically modified or eliminated by the regulatory alternative under consideration, these requirements would continue to apply as would occur under the No Action Alternative (Alternative 1).

The gear modification requirements under consideration fall generally into five categories: groundline requirements, buoy line requirements, weak link and anchoring requirements, set restrictions and gear stowing requirements, and gear marking requirements. The discussion below examines the impact of each of these measures on whale entanglement risks.<sup>5</sup>

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<sup>4</sup> Under Alternatives 2 through 6, for shark gillnet fisheries, the portion of the Southeast U.S. Restricted Area overlapping the Southeast U.S. Observer Area north of 27°51' N would be renamed the “Northern Monitoring and Restricted Area,” and the portion of the Southeast U.S. Observer Area south of 27°51' N would be renamed the “Southern Monitoring Area.” For non-shark gillnet fisheries, the waters north of 27°51' N, where gillnetting occurs, would be designated as “Other Southeast Gillnet Waters.” To avoid confusion in comparing current regulatory requirements to those under each alternative, this document retains the original nomenclature.

<sup>5</sup> For additional detail on which gear requirements apply to which vessels under existing regulations (i.e., Alternative 1, No Action), see Chapter 2. For similar details regarding Alternatives 2 through 6, see Chapter 3.

**Exhibit 5-1**  
**PROPOSED REGULATIONS BY GEAR PROVISION AND ALTERNATIVE: LOBSTER TRAP/POT FISHERY<sup>1</sup>**

Vessels Fishing In	Buoy Line Modification					Groundline Modification <sup>2</sup>					Weak Link Modification <sup>3</sup>					Set Restrictions					Gear Marking Modification <sup>4</sup>				
	2 <sup>5</sup>	3 <sup>5</sup> *	4 <sup>5</sup>	5 <sup>6</sup>	6 <sup>7</sup> *	2	3 *	4	5	6 *	2	3 *	4	5	6 *	2 <sup>8</sup>	3 <sup>8</sup> *	4 <sup>8</sup>	5 <sup>9</sup>	6 <sup>9</sup> *	2	3 *	4	5	6 *
Cape Cod Bay: January 1 – May 15											●	●	●	●	●						●	●	●	●	●
Cape Cod Bay: May 16 – December 31						●	●	●		●	●	●	●	●	●	○	○	○	○	○	●	●	●	●	●
Great South Channel: July 1 - March 31						●	●	●		●	●	●	●	●	●						●	●	●	●	●
LMA 6						●	●	●		●	●	●	●	●	●						●	●	●	●	●
Offshore North of 35°30'N						●	● <sup>10</sup>	●		● <sup>10</sup>	●	○ <sup>10</sup>	●	○ <sup>10</sup>	○ <sup>10</sup>						●	●	●	●	●
Offshore South of 35°30'N						●	● <sup>10</sup>	● <sup>11</sup>		● <sup>10</sup>	●	● <sup>10</sup>	● <sup>11</sup>	● <sup>10</sup>	● <sup>10</sup>						●	●	●	●	●
Northern Inshore						●	●	●		●	●	●	●	●	●						●	●	●	●	●
Northern Nearshore						●	●	●		●	●	●	●	●	●	○	○	○	○	○	●	●	●	●	●
Current SAM: March 1 - July 31	○	○	○	○	○						●	●	●	●	●	○	○	○	○	○	●	●	●	●	●
Revised SAM: March 1 - July 31	■	■	■	●	●	■	■	■	●	●	■	■	■	●	●	■	■	■	■	■	■	■	■	●	●
Stellwagen Bank/Jeffrey's Ledge						●	●	●		●	●	●	●	●	●	○	○	○	○	○	●	●	●	●	●
Southern Nearshore North of 35°30'N						●	● <sup>10</sup>	●		● <sup>10</sup>	●	○ <sup>10</sup>	●	○ <sup>10</sup>	○ <sup>10</sup>						●	●	●	●	●
Southern Nearshore South of 35°30'N						●	● <sup>10</sup>	● <sup>11</sup>		● <sup>10</sup>	●	● <sup>10</sup>	● <sup>11</sup>	● <sup>10</sup>	● <sup>10</sup>						●	●	●	●	●

## Key:

- = Existing Baseline Requirements, as would continue to occur under the No Action Alternative (Alternative 1)
- = Addition to Existing Requirements
- = Relaxation of Existing Requirements
- = Not Applicable
- \* = Preferred Alternative

Notes: For specific details of various provisions, see Chapter 3, Regulatory Alternatives.

<sup>1</sup> Table does not include universal gear modifications because they are not altered under the proposed alternatives.

<sup>2</sup> All groundline must be made entirely of sinking and/or neutrally buoyant line. This provision would become effective in the revised Seasonal Area Management (SAM) zone (under Alternatives 5 and 6 only) within six months of the rule's publication, and by 2008 in all other cases. Vessels fishing in water deeper than 280 fathoms are exempt from this requirement.

<sup>3</sup> Weak links must be placed on all flotation and weighted devices attached to the buoy line, such as surface buoys and toggles. In nearshore/inshore lobster waters, including the Great South Channel Restricted Area that overlaps with LMA 2 and the Outer Cape LMA, weak links with a breaking strength of 600 lb. would be required. In offshore lobster waters, including the Great South Channel Restricted Area that overlaps with LMA 2/3 Overlap and LMA 3 between July 1 and March 31, the breaking strength on buoys would be reduced from 2000 lb. To 1500 lb. For vessel groups subject to weak link requirements under existing ALWTRP regulations, new weak links would only need to be installed on toggles or similar flotation and weighted devices.

<sup>4</sup> Alternatives 2 through 6 remove current ALWTRP gear marking schemes and require all vessels to identify buoy lines with a four inch mark every ten fathoms, and to mark all surface buoys with either their vessel number or permit number.

<sup>5</sup> The requirement that vessels fishing in SAM waters use buoy lines made entirely of sinking and/or neutrally buoyant line is eliminated in 2008.

<sup>6</sup> Requires the upper two-thirds of the buoy line to be made of sinking and/or neutrally buoyant line. For vessels fishing in SAM waters as currently defined, this provision relaxes existing requirements, allowing the bottom third of the buoy line to be made of floating line. For vessels fishing in areas that would be newly incorporated into the SAM zone, this provision represents a new requirement.

<sup>7</sup> Requires the upper two-thirds of the buoy line to be made of sinking and/or neutrally buoyant line in SAM waters until 2008, when SAM provisions are eliminated.

<sup>8</sup> Set restrictions in Northern Nearshore waters, Stellwagen Bank/Jeffrey's Ledge, and in Federal waters of Cape Cod Bay, May 16 to December 31 would change from one buoy line for trawls with 5 traps or fewer to one buoy line for trawls of 4 traps or fewer. Restrictions in SAM waters limiting trawls to one buoy line would be eliminated in 2008.

<sup>9</sup> For vessels fishing in SAM waters as currently defined, this provision changes existing set restrictions, allowing two buoy lines for all trawls. Set restrictions in Northern Nearshore waters, Stellwagen Bank/Jeffrey's Ledge, and in Federal waters of Cape Cod Bay, May 16 to December 31 would change from one buoy line for trawls with 5 traps or fewer to one buoy line for trawls of 4 traps or fewer. The prohibition of single traps in these two areas would not change from existing regulations.

<sup>10</sup> Provision only applies September 1 to May 31 for vessels fishing between 40°00'N and the SC/GA border, November 15 to April 15 for vessels fishing between the SC/GA border and 29°00'N, and December 1 to March 31 for vessels fishing between 29°00'N and 27°51'N. Requirements apply year-round for all other vessels.

<sup>11</sup> Provision only applies November 15 to April 15 for vessels fishing between the SC/GA border and 29°00'N, and December 1 to March 31 for vessels fishing between 29°00'N and 27°51'N. Requirements apply year-round for all other vessels.

<sup>12</sup> This provision is unchanged to the extent that the revised SAM area is identical to the existing SAM area. Where the revised SAM area includes areas not regulated under the existing SAM, this provision represents an addition to existing requirements. Where the revised SAM area excludes areas that are regulated under the existing SAM, this provision represents a relaxation of existing requirements.

**Exhibit 5-2**  
**PROPOSED REGULATIONS BY GEAR PROVISION AND ALTERNATIVE: OTHER TRAP/POT FISHERIES<sup>1</sup>**

	Buoy Line Modification					Groundline Modification <sup>2</sup>					Weak Link Modification <sup>3</sup>					Set Restrictions					Dynamic Area Management <sup>4</sup>					Gear Marking Mod. <sup>5</sup>
Vessels Fishing In:	2 <sup>6</sup>	3 <sup>6</sup> *	4 <sup>6</sup>	5 <sup>7</sup>	6 <sup>8</sup> *	2	3 *	4	5	6 *	2	3 *	4	5	6 *	2 <sup>9</sup>	3 <sup>9</sup> *	4 <sup>9</sup>	5 <sup>10</sup>	6 <sup>10</sup> *	2	3 *	4	5	6 *	2-6
Cape Cod Bay: January 1 - May 15	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●			●
Cape Cod Bay: May 16 – December 31						●	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●			●
Great South Channel: July 1 – March 31 <sup>11</sup>						●	●	●		●	●	●	●	●							●	●	●			●
LMA 6						●	●	●		●	●	●	●	●	●						●	●	●			●
Offshore						●	● <sup>12</sup>	● <sup>13</sup>		● <sup>12</sup>	●	● <sup>12</sup>	● <sup>13</sup>	● <sup>12</sup>	● <sup>12</sup>						●	●	●			●
Northern Inshore						●	●	●		●	●	●	●	●	●						●	●	●			●
Northern Nearshore						●	●	●		● <sup>12</sup>	●	● <sup>12</sup>	● <sup>13</sup>	● <sup>12</sup>	● <sup>12</sup>	●	●	●	●	●	●	●	●			●
Current SAM: March 1 - July 31	●	●	●			●	●	●			●	●	●			●	●	●			●	●	●			●
Revised SAM: March 1 - July 31				●	●				●	●				●	●					●	●	●			●	
Stellwagen Bank/Jeffrey's Ledge						●	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●			●
Southern Nearshore						●	● <sup>12</sup>	● <sup>13</sup>		● <sup>12</sup>	●	● <sup>12</sup>	● <sup>13</sup>	● <sup>12</sup>	● <sup>12</sup>						●	●	●			●

**Key:**

- = New Requirements
- = Not Applicable
- \* = Preferred Alternative

Notes: For specific details of various provisions, see Chapter 3, Regulatory Alternatives.

<sup>1</sup> Table does not include universal gear modifications because they are not altered under the proposed alternatives.

<sup>2</sup> All groundline must be made entirely of sinking and/or neutrally buoyant line. This provision would become effective in Cape Cod Bay (January 1 - May 15) and SAM waters within six months of the rule's publication, and by 2008 elsewhere. Vessels fishing in water deeper than 280 fathoms are exempt from this requirement.

<sup>3</sup> Weak links must be placed on all flotation and weighted devices attached to the buoy line, such as surface buoys and toggles. Installing weak links at all surface buoys off the buoy line will place vessels fishing in Northern Inshore waters in compliance with the requirement to install at least one option from the Lobster Take Reduction Technology List under Alternative 5.

<sup>4</sup> All other trap/pot vessels may be temporarily restricted in areas north of 40°00'N latitude when aggregations of right whales are observed under the Dynamic Area Management (DAM) program until 2008, when the DAM program is eliminated. If a DAM zone is triggered, to continue fishing the following gear modifications may be required: all groundlines and the upper two-thirds of all buoy lines must be made of either sinking and/or neutrally buoyant line, and a weak link with a maximum breaking strength of 600 lb. (1500 lb. in offshore areas and the Great South Channel Restricted Area that overlaps with LMA 2/3 Overlap and LMA 3 from July 1 to March 31) must be placed at all buoys.

<sup>5</sup> All vessels are required to identify buoy lines with a four inch mark every ten fathoms, and to mark all surface buoys with either their vessel number or permit number.

<sup>6</sup> Requires the upper two-thirds of the buoy line to be made of sinking and/or neutrally buoyant line in Cape Cod Bay, January 1 - May 15. Requires buoy line to be made entirely of sinking and/or neutrally buoyant line in SAM waters until 2008, when SAM provisions are eliminated.

<sup>7</sup> Requires the upper two-thirds of the buoy line to be made of sinking and/or neutrally buoyant line.

<sup>8</sup> Requires the upper two-thirds of the buoy line to be made of sinking and/or neutrally buoyant line in Cape Cod Bay, January 1 - May 15. Requires the upper two-thirds of the buoy line to be made of sinking and/or neutrally buoyant line in SAM waters until 2008, when SAM provisions are eliminated.

<sup>9</sup> Set restrictions include (1) limiting sets in Cape Cod Bay from January 1 to May 15 to pairs or trawls of four or more traps/pots, (2) prohibiting single traps and limiting sets to one buoy line for trawls with 4 or fewer traps in Northern Nearshore waters, Stellwagen Bank/Jeffrey's Ledge, and in Federal waters of Cape Cod Bay, May 16 to December 31, and (3) limiting sets to one buoy line per trawl in SAM restricted waters until 2008, when SAM provisions are eliminated.

<sup>10</sup> Set restrictions include (1) limiting sets in Cape Cod Bay from January 1 to May 15 to pairs or trawls of four or more traps/pots and (2) prohibiting single traps and limiting sets to one buoy line for trawls with 4 or fewer traps in Northern Nearshore waters, Stellwagen Bank/Jeffrey's Ledge, and in Federal waters of Cape Cod Bay, May 16 to December 31.

<sup>11</sup> Great South Channel is closed to all trap/pot vessels from April 1 to June 30.

<sup>12</sup> Provision only applies September 1 to May 31 for vessels fishing between 40°00'N and the SC/GA border, November 15 to April 15 for vessels fishing between the SC/GA border and 29°00'N, and December 1 to March 31 for vessels fishing between 29°00'N and 27°51'N. Requirements apply year-round for all other vessels.

<sup>13</sup> Provision only applies November 15 to April 15 for vessels fishing between the SC/GA border and 29°00'N, and December 1 to March 31 for vessels fishing between 29°00'N and 27°51'N. Requirements apply year-round for all other vessels.

Exhibit 5-3

**PROPOSED GEAR MODIFICATIONS, BY PROVISION, GEAR TYPE, AND ALTERNATIVE: NORTHEAST AND MID-ATLANTIC GILLNETS<sup>1</sup>**

Vessels Fishing In	Gear Marking Mod. <sup>2</sup>	Groundline Modification <sup>3</sup>					Flotation and Weighted Device Weak Link Mod. <sup>4</sup>					Net Panel Weak Link Modification <sup>5</sup>					Anchoring Requirement Modification <sup>5</sup>					Buoy Line Modifications					
	2-6	2	3	4	5	6	2	3	4	5	6	2	3	4	5	6	2	3	4	5	6	2 <sup>6</sup>	3 <sup>6</sup>	4 <sup>6</sup>	5 <sup>7</sup>	6 <sup>8</sup>	
	*		*			*		*			*		*			*		*			*		*		*		
<b>Northeast Anchored Gillnets</b>																											
Cape Cod Bay, Great South Channel Gillnet Area, and Great South Channel Sliver Area <sup>9,10</sup>	●	●	●	●		●	●	●	●	●	●	●	●	●		●	●	●	●		●						
Stellwagen Bank/Jeffrey's Ledge and Other Northeast Waters North <sup>11</sup>	●	●	●	●		●	●	●	●	●	●	●	●	●		●	●	●	●		●						
Other Northeast Waters South: Sep 1 – May 31 <sup>11</sup>	●	●	●	●		●	●	●	●	●	●	●	●	●		●	●	●	●		●						
Other Northeast Waters South: Jun 1 – Aug 31 <sup>11</sup>	●	●		●			●	○	●	●	○	●	○	●		○	●	○	●		○						
Current SAM: Mar 1 – Jul 31 <sup>12</sup>	●	<sup>13</sup>	<sup>13</sup>	<sup>13</sup>			●	●	●													○	○	○			
Revised SAM: Mar 1 – Jul 31 <sup>12</sup>	●					● <sup>14</sup>	● <sup>14</sup>			●	●					● <sup>14</sup>	● <sup>14</sup>				● <sup>14</sup>	● <sup>14</sup>			●	●	
<b>Mid-Atlantic Anchored Gillnets</b>																											
Areas 1 and 2: Sep 1 – May 31 <sup>15</sup>	●	●	●	●		●	●	●	●	●	●	●	●	●		●											
Areas 1 and 2: Jun 1 – Aug 31	●	●		●			●		●			●		●			●		●								
<b>Driftnets</b>																											
Northeast (North) <sup>16</sup>	●											●	●	●		●											
Other Northeast Waters South: Sep 1 – May 31 <sup>11</sup>	●											●	●	●		●											
Other Northeast Waters South: Jun 1 – Aug 31 <sup>11</sup>	●											●		●													
Mid-Atlantic: Sep 1 – May 31	●											●	●	●		●											
Mid-Atlantic: Jun 1 – Aug 31	●											●		●													

Key: ■ = Existing Baseline Requirements, as would continue to occur under the No Action Alternative (Alternative 1)

● = Addition to Existing Requirements

○ = Relaxation of Existing Requirements

■ = Not Applicable

\* = Preferred Alternative

Area 1 = West of 72°30'W and north of 33°51'N (NC/SC border).

Area 2 = South of VA/NC border, west of the Exclusive Economic Zone boundary, north of SC/GA border, and excluding Area 1 (defined above).

Notes: For specific details of various provisions, see Chapter 3, Regulatory Alternatives.

<sup>1</sup> Table does not include universal gear modifications because they are not altered under the regulatory alternatives.

<sup>2</sup> Alternatives 2 through 6 remove current ALWTRP gear marking schemes and require all vessels in the Northeast and Mid-Atlantic to mark surface buoys with vessel or permit number, and to identify buoy lines with a four inch mark every ten fathoms.

<sup>3</sup> Groundlines must be made entirely of sinking and/or neutrally buoyant line by 2008. Vessels fishing in water deeper than 280 fathoms are exempt from this requirement.

<sup>4</sup> Weak links required on all flotation and/or weighted devices attached to the buoy line, such as toggles or leaded lines. Existing requirements call for weak links only on buoy lines attached to the main buoy.

<sup>5</sup> Anchored gillnets in the Northeast must increase 1,100 pound weak links from one to five or more, depending on panel size, per net panel and secure anchored gillnets with the holding power of at least a 22-pound Danforth-style anchor at each end of the net string, consistent with existing SAM regulations. In the Mid-Atlantic, anchored gillnets must either increase the number of 1,100 pound weak links per net panel from one to five or more, and be secured at each end by a Danforth-style anchor or gear must be stored on board when the vessel returns to port. For driftnet vessels fishing with tended gear at night, one 1,100 pound weak link required per net panel.

<sup>6</sup> The requirements that vessels fishing in SAM waters may only use one buoy line per string and that buoy lines are made entirely of sinking and/or neutrally buoyant line are eliminated in 2008.

<sup>7</sup> Requires the upper two-thirds of the buoy line to be made of sinking and/or neutrally buoyant line. The bottom third of the buoy line may be floating line and vessels may use two buoy lines per string. This provision relaxes requirements for vessels fishing in SAM waters as currently defined, but represents a new requirement for vessels fishing in areas newly incorporated into the SAM zone.

<sup>8</sup> Requires the upper two-thirds of the buoy line to be made of sinking and/or neutrally buoyant line in SAM waters until 2008, when SAM provisions are eliminated. The lower third of the buoy line may be floating line and vessels may use two buoy lines per string. This provision relaxes requirements for vessels fishing in SAM waters as currently defined, but represents a new requirement for vessels fishing in areas newly incorporated into the SAM zone.

<sup>9</sup> Provisions apply in Cape Cod Bay from May 16 to December 31, in Great South Channel Gillnet Area from July 1 to March 31, and in Great South Channel Sliver Area year-round.

<sup>10</sup> Under Alternatives 5 & 6, Great South Channel Gillnet Area is closed from April 1 through June 30 (from July 1 to July 31, this area is included in the revised SAM area); critical habitat restrictions (as indicated) apply July 1 through March 31. Great South Channel Sliver Area critical habitat restrictions (as indicated) apply August 1 through April 30; SAM restrictions apply May 1 through July 31.

<sup>11</sup> Other Northeast Waters Area is divided into north and south regions by a line beginning at 41°18.2'N latitude and 71°51.5'W longitude, south to 40°00'N, and east to the Exclusive Economic Zone boundary.

<sup>12</sup> Restrictions in SAM are in addition to existing restrictions in overlapping sections of Stellwagen Bank/Jeffrey's Ledge and Other Northeast Waters. The Great South Channel Gillnet Area (excluding the Sliver Area) remains closed to gillnetting from April 1 through June 30. Refer also to footnote 10.

<sup>13</sup> Vessels fishing in SAM waters must already use sinking and/or neutrally buoyant groundline.

<sup>14</sup> Where the revised SAM area includes areas not regulated under the existing SAM, the use of non-floating or neutrally buoyant groundline, five or more 1,100 pound weak links per net panel, and 22-pound Danforth style anchors represent additional requirements, and these provisions apply immediately. Where the revised SAM area excludes areas that are regulated under the existing SAM, these provisions relax some existing requirements.

<sup>15</sup> Existing provisions (shaded) apply to Area 1 only from December 1 through March 31.

<sup>16</sup> Includes all regulated areas north of a line beginning at 41°18.2'N latitude and 71°51.5'W longitude, south to 40°00'N, and east to the Exclusive Economic Zone boundary. Driftnet fishing is prohibited in Cape Cod Bay Restricted Area from January 1 to May 15 and in Great South Channel Restricted Gillnet Area (excluding the Sliver Area) from April 1 to June 30.

Exhibit 5-4

PROPOSED GEAR MODIFICATIONS, BY PROVISION, GEAR TYPE, AND ALTERNATIVE: SOUTHEAST GILLNETS<sup>1</sup>

Vessels Fishing In	Universal Gear Modifications	Gear Marking Modification <sup>2</sup>	Non-Floating Line Modification <sup>3</sup>					Buoy Line Weak Link Modification <sup>4</sup>					Net Panel Weak Link Modification <sup>5</sup>					Anchoring Requirement Modification <sup>5</sup>				
	2 - 6	2 - 6	2	3*	4	5	6*	2	3*	4	5	6*	2	3*	4	5	6*	2	3*	4	5	6*
Southeast Atlantic Gillnets																						
Area 1: Nov 15 – Apr 15	●	●	●	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Area 2: Nov 15 – Apr 15	●	●	●	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Areas 1 and 2: Apr 16 – Nov 14	●	●	●					●					●					●				
Area 3: Nov 15 – Nov 30	●	●	●					●					●					●				
Areas 3 and 4: Dec 1 – Mar 31	●	●	●	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Area 3: Apr 1 – Nov 14	●	●	●					●					●					●				
Area 4: Apr 1 – Nov 30	●	●	●					●					●					●				
Areas 5 and 6	●	●																				
Shark Gillnets																						
U.S. Restricted and Observer Areas		○ <sup>6</sup>																				
Key: ■ = Existing Baseline Requirements, as would continue to occur under the No Action Alternative (Alternative 1) ● = Addition to Existing Requirements ○ = Relaxation of Existing Requirements ■ = Not Applicable * = Preferred Alternative																						
Area 1 = South of SC/GA border, west of 80°00'W, and north of 29°00'N. Area 2 = South of SC/GA border, east of 80°00'W, west of the Exclusive Economic Zone boundary, and north of 29°00'N. Area 3 = South of 29°00'N, west of 80°00'W, and north of 27°51'N. Area 4 = South of 29°00'N, east of 80°00'W, west of the Exclusive Economic Zone boundary, and north of 27°51'N. Area 5 = South of 27°51'N, west of 80°00'W, and north of 26°46.5'N. Area 6 = South of 27°51'N, east of 80°00'W, west of the Exclusive Economic Zone boundary, and north of 26°46.5'N.																						
Notes: For specific details of various provisions, see Chapter 3, Regulatory Alternatives. <sup>1</sup> Proposed alternatives specify replacement of observer coverage with a vessel monitoring system. <sup>2</sup> Alternatives 2 through 6 remove current ALWTRP gear marking schemes, with the exception of shark net panel gear marking (which remains the same), and require all vessels (including shark vessels) to mark surface buoys with vessel or permit number, and to identify buoy lines with a four inch mark every ten fathoms. In addition, shark gear must have one 4" blue mark and one 4" green mark once every 100 yards along both the float line and the leadline for each net panel. If shark vessel buoy lines are less than or equal to four feet in length, no buoy line marking is required. <sup>3</sup> Groundlines must be made entirely of sinking and/or neutrally buoyant line by 2008. Vessels fishing in water deeper than 280 fathoms are exempt from this requirement. <sup>4</sup> Weak links required on all flotation and/or weighted devices attached to the buoy line, such as toggles or leaded lines. <sup>5</sup> Requires gillnets to return to port with the vessel or be anchored at each end with the holding power of a 22-lb. Danforth anchor and have five or more 1,100 pound weak links per net panel, depending on panels size, under Alternatives 2, 3, 4, and 6. Only one 1,100 pound weak link per net panel is required under Alternative 5. <sup>6</sup> Gear marking requirements apply to the larger restricted and observer/monitoring areas defined under Alternatives 2 through 6.																						

## Exhibit 5-5

**PROPOSED FISHING REQUIREMENTS AND CLOSURES, BY PROVISION AND ALTERNATIVE: NORTHEAST AND MID-ATLANTIC DRIFT GILLNETS**

Vessels Fishing In	Closures <sup>1</sup>					Night Set Restriction <sup>2</sup>					Gear Stowing Requirement <sup>3</sup>				
	2	3*	4	5	6*	2	3*	4	5	6*	2	3*	4	5	6*
<b><i>Northeast</i></b>															
Cape Cod Bay and Great South Channel Gillnet Area <sup>4</sup>	●	●	●	●	●										
Cape Cod Bay, Great South Channel Gillnet Area, Great South Channel Sliver, Stellwagen Bank/Jeffrey's Ledge, and Other Northeast Waters North <sup>5,6</sup>						●	●	●	●	●	●	●	●	●	●
Other Northeast Waters South: Sep 1 – May 31 <sup>6</sup>						●	●	●	●	●	●	●	●	●	●
Other Northeast Waters South: Jun 1 – Aug 31 <sup>6</sup>						●		●	●		●		●	●	
<b><i>Mid-Atlantic</i></b>															
Area 1: Sep 1 – Nov 30 and Apr 1 – May 31						●	●	●	●	●	●	●	●	●	●
Area 1: Dec 1 – Mar 31						■	■	■	■	■	■	■	■	■	■
Areas 1 and 2: Jun 1 – Aug 31						●		●			●		●		
Area 2: Sep 1 – May 31						●	●	●	●	●	●	●	●	●	●
Key: ■ = Existing Baseline Requirements, as would continue to occur under the No Action Alternative (Alternative 1) ● = Addition to Existing Requirements ○ = Change to Existing Requirements ■ = Not Applicable * = Preferred Alternative															
Area 1 = West of 72°30'W and north of 33°51'N (NC/SC border). Area 2 = South of VA/NC border, west of the Exclusive Economic Zone boundary, north of SC/GA border, and excluding Area 1 (defined above).															
Notes: For specific details of various provisions, see Chapter 3, Regulatory Alternatives. <sup>1</sup> Inclusion of Northeast driftnets under Alternatives 2 through 6 will result in closing the Cape Cod Bay driftnet fishery from January 1 through May 15 and closing the Great South Channel Gillnet Area driftnet fishery from April 1 through June 30. <sup>2</sup> No fishing with driftnet gear at night unless gear is tended. <sup>3</sup> Gear must be removed from the water and stowed on board the vessel before returning to port. <sup>4</sup> Provisions apply to Cape Cod Bay from January 1 through May 15 and to Great South Channel Gillnet Area from April 1 through June 30. <sup>5</sup> Provisions apply to Cape Cod Bay from May 16 through December 31 and to Great South Channel Gillnet Area from July 1 through March 31. In all other areas listed, the provisions apply year-round. <sup>6</sup> The Other Northeast Waters Area is divided into north and south regions by a line beginning at 41°18.2'N latitude and 71°51.5'W longitude, south to 40°00'N, and east to the Exclusive Economic Zone boundary.															



Exhibit 5-6 PROPOSED FISHING REQUIREMENTS AND CLOSURES, BY PROVISION AND ALTERNATIVE: SOUTHEAST GILLNETS																										
Vessels Fishing In	Closures <sup>1,2</sup>					Night Set Restrictions <sup>1,3</sup>					Spotter Plane Requirement <sup>1,4</sup>					Whale Approach Requirement <sup>1,5</sup>					Monitoring Requirement <sup>6</sup>					
	2	3*	4	5	6*	2	3*	4	5	6*	2	3*	4	5	6*	2	3*	4	5	6*	2	3*	4	5	6*	
<b>Shark Gillnets</b>																										
Area 1: Nov 15 – Mar 31																					○ <sup>1</sup>	○ <sup>1</sup>	○ <sup>1</sup>	○ <sup>1</sup>	○ <sup>1</sup>	
Area 1: Apr 1 – Apr 15	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
Areas 1 and 2: Apr 16 – Nov 14																●										
Area 2: Nov 15 – Apr 15	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
Area 3: Nov 15 – Nov 30	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○		○	○	○	○	○	○ <sup>1</sup>	○ <sup>1</sup>	○ <sup>1</sup>	○ <sup>1</sup>	○ <sup>1</sup>
Area 3: Dec 1 – Mar 31																					○	○	○	○	○	
Area 3: Apr 1 – Nov 14																●										
Area 4: Dec 1 – Mar 31	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
Area 4: Apr 1 – Nov 30																●										
Area 5: Nov 15 – Nov 30																					○ <sup>1</sup>	○ <sup>1</sup>	○ <sup>1</sup>	○ <sup>1</sup>	○ <sup>1</sup>	
Area 5: Dec 1 – Mar 31																					○	○	○	○	○	
Area 6: Dec 1 – Mar 31																					●	●	●	●	●	
<b>Southeast Atlantic Gillnets</b>																										
Area 1: Nov 15 – Mar 31; Area 3: Dec 1 – Mar 31																										
Area 2: Nov 15 – Apr 15; Area 1: Apr 1 - Apr 15; Area 4: Dec 1 - Mar 31						●	●	●	●	●																
Area 3: Nov 15 – Nov 30						○	○	○	○	○																
Key: ■ = Existing Baseline Requirements, as would continue to occur under the No Action Alternative (Alternative 1) ● = Addition to Existing Requirements ○ = Change to Existing Requirements ■ = Not Applicable * = Preferred Alternative																										
Area 1 = South of SC/GA border, west of 80°00'W, and north of 29°00'N.																										
Area 2 = South of SC/GA border, east of 80°00'W, west of the Exclusive Economic Zone boundary, and north of 29°00'N.																										
Area 3 = South of 29°00'N, west of 80°00'W, and north of 27°51'N.																										
Area 4 = South of 29°00'N, east of 80°00'W, west of the Exclusive Economic Zone boundary, and north of 27°51'N.																										
Area 5 = South of 27°51'N, west of 80°00'W, and north of 26°46.5'N.																										
Area 6 = South of 27°51'N, east of 80°00'W, west of the Exclusive Economic Zone boundary, and north of 26°46.5'N.																										
Notes: For specific details of various provisions, see Chapter 3, Regulatory Alternatives.																										
<sup>1</sup> Changes in existing provisions are due to changes in restricted times and areas under Alternatives 2 through 6.																										
<sup>2</sup> Area closed to shark gillnet fishing, except for strikenetting.																										
<sup>3</sup> No straight sets of gillnet gear at night. Strikenet gear may not be set at night or when visibility is less than 500 yards.																										
<sup>4</sup> Restriction is applicable only to vessels strikenetting for sharks.																										
<sup>5</sup> If a right, humpback, or fin whale moves within three nautical miles of set gear, the gear must be removed immediately from the water and cannot be reset until the whale is no longer in the area.																										
<sup>6</sup> Under Alternative 1, vessel operator must call NMFS’ Southeast Regional Office not less than 48 hours prior to departure to arrange for observer coverage. Under Alternatives 2 through 6 vessels must use a Vessel Monitoring System (VMS), as implemented in the Highly Migratory Species (HMS) Fishery Management Plan (FMP) (68 FR 74746).																										

### 5.1.1.1 Groundline Requirements

Floating groundline has been involved in the entanglement of a number of North Atlantic large whales. Johnson et al. (2005) found that floating groundline was involved in six of 25 right and humpback whale entanglements in which parts of the entangling gear were identified.<sup>6</sup> The line is designed to float in the water column and avoid contact with the sea floor; however, any slack in the line can allow floating loops of excess line to form. This poses an entanglement threat to large whales, which are known to frequent all portions of the water column. For example, during feeding activities in Cape Cod Bay, three right whales tagged by multi-sensor telemetry units spent between 17 and 31 percent of their time in the lower third of the water column (Wiley and Goodyear, 1998). When not feeding, the percentage of time spent in the lower third of the water column increased to between 27 and 40 percent.

Data on the quantity of floating groundline currently used by the gillnet, lobster trap/pot, and other trap/pot fisheries in waters potentially subject to ALWTRP regulations are unavailable. The economic analysis presented in Chapter 6, however, is based in part on estimates of the amount of groundline typically used by vessels in these fisheries, as well as the number of active vessels in each fishery. Using these figures, it is possible to develop an overall estimate of the amount of groundline these vessels employ. Exhibit 5-7 presents these estimates. As the exhibit indicates, vessels in the fisheries of interest are estimated to employ more than 44.5 million fathoms of groundline. The vast majority of this groundline – approximately 43.1 million fathoms – is assumed to be floating line. The remainder – approximately 1.5 million fathoms – is assumed to be sinking and/or neutrally buoyant groundline, which is used in certain areas (e.g., by lobster trap/pot vessels in the Cape Cod Bay Restricted Area) to comply with current ALWTRP requirements. The estimate for the lobster trap/pot fishery accounts for approximately 95 percent of the floating groundline currently in use. The remainder is accounted for by gillnet fisheries (3 percent) and other trap/pot fisheries (2 percent).

<b>Exhibit 5-7</b>			
<b>ESTIMATED QUANTITY OF GROUNDLINE IN USE</b>			
<b>(thousands of fathoms)</b>			
<b>Fishery</b>	<b>Floating Line</b>	<b>Sinking and/or Neutrally Buoyant Line</b>	<b>Total</b>
Lobster trap/pot	40,919	1,487	42,406
Gillnet	1,231	11	1,242
Other trap/pot	907	-	907
<b>TOTAL</b>	<b>43,057</b>	<b>1,498</b>	<b>44,554</b>
Note: Columns and rows may not sum to reported totals due to rounding error.			

<sup>6</sup> The six floating groundline entanglements included three of each species. Five involved trap/pot gear (two right and three humpback whales); four of these whales were resighted gear-free (one right and all three humpback whales). The fifth animal (a right whale) was deemed potentially dead and is a unique case because it was involved in at least three separate entanglement events; therefore, the gear part that resulted in this whale's outcome is unknown. The last case involved a right whale entangled in floating groundline associated with a sink gillnet. This whale subsequently died.

To reduce the risk of entanglement associated with floating groundline, Alternatives 2 through 6 would require the use of sinking and/or neutrally buoyant (i.e., non-floating) groundline in designated areas at specified times. Specifically:

- Alternative 2 would require the lobster trap/pot, other trap/pot, Northeast anchored gillnet, and Mid-Atlantic anchored gillnet fisheries to use sinking and/or neutrally buoyant groundline year-round. This requirement would also apply to the Southeast gillnet fishery north of 27°51' N latitude (see Exhibit 3-3 for Alternative 2 Management Areas). The regulation would take effect in 2008.
- Alternative 3 (Preferred) would require the fisheries identified above to use sinking and/or neutrally buoyant groundline on a year-round basis in waters north and east of a line extending from Watch Hill, Rhode Island (41°18.2' N and 71°51.5' W) south to 40°00' N, then east to the boundary of the Exclusive Economic Zone. From this area south to the South Carolina/Georgia border, the requirement would only be in effect from September 1 through May 31. Between the South Carolina/Georgia border and 29°00' N latitude, the requirement would be in effect from November 15 through April 15. Finally, between 29°00' N and 27°51' N, the requirement would apply from December 1 through March 31 (see Exhibit 3-7 for Alternative 3 Management Areas).
- Alternative 4 would require the fisheries identified above to use sinking and/or neutrally buoyant groundline on a year-round basis north of the South Carolina/Georgia border. South of this area, the seasonal requirements specified under Alternative 3 (Preferred) would apply (see Exhibit 3-8 for Alternative 4 Management Areas).
- Alternative 5 would maintain existing standards requiring lobster trap/pot gear and anchored gillnet gear to use sinking and/or neutrally buoyant groundline in the Cape Cod Bay Restricted Area from January 1 through May 15, and in the SAM zone from March 1 through July 31. This requirement would be extended to additional areas to be incorporated into the SAM zone, and also would be extended to other trap/pot gear subject to the SAM program. The extension of the regulations would take effect six months after promulgation of the rule (see Exhibit 3-10 for Alternative 5 Management Areas).
- Alternative 6 (Preferred) would combine elements of Alternative 3 (Preferred) and Alternative 5. From six months after promulgation of the rule until 2008, the groundline requirements specified under Alternative 5 for the Cape Cod Bay Restricted Area and the expanded SAM zone would be in effect; thereafter, the groundline requirements specified under Alternative 3 (Preferred) would become effective (see Exhibit 3-11 for Alternative 6 Management Areas).

In all cases, the intent of the requirement to use sinking and/or neutrally buoyant groundline is to reduce entanglement risks. The potential direct and indirect effects of this requirement are discussed below.

*Direct effects:*

The requirement to use non-floating groundline is designed to reduce the likelihood of interactions between large whales and fishing gear by reducing the amount of line in the water column.<sup>7</sup> A recent study of underwater profiles of groundline conducted by the Massachusetts Division of Marine Fisheries demonstrated that non-floating groundline does not form arcs of line in the water column (McKiernan et al., 2002). Video recording of neutrally buoyant line between traps (i.e., groundline) revealed that it did not have the same vertical profile as floating line; rather, it was located on or near the bottom and thus was less of an entanglement risk to large whales. An analysis conducted for the lobster industry determined that requiring the use of sinking and/or neutrally buoyant groundline would eliminate approximately 85 percent of the line within the water column (66 FR 59394). Thus, requiring the use of non-floating groundline would directly benefit large whales, reducing the likelihood of entanglement.<sup>8</sup> Alternatives 2 through 4 and 6 would require that approximately 43,000,000 fathoms of groundline to be converted to sinking and/or neutrally buoyant line compared to the status quo (Alternative 1).<sup>9</sup> Since Alternative 5 would apply to fishing gear only in areas within the expanded SAM area and does not include broad-based gear modifications, approximately 200,000 fathoms of groundline would be converted under this alternative (see Exhibit 5-11 in section 5.1.3.2). Thus, compared to Alternatives 2 through 4 and 6, reduction of entanglement risks from floating groundline may be less under Alternative 5.

Although the broad-based sinking/neutrally buoyant groundline requirement will not be fully in effect until 2008, it is NMFS' belief that the changeover to sinking and/or neutrally buoyant groundline may begin prior to 2008 as fishermen replace their groundline as it naturally wears out. According to a Massachusetts Division of Marine Fisheries (MADMF) gear buyback program survey of fishermen who most likely represent the Massachusetts inshore lobster trawl fleet, this fishery has undergone an estimated 10 percent reduction in the amount of floating groundline used between 2002 and 2003. The data indicated that 46.7 percent of the fishermen who responded to the survey (515 out of 1196 surveys sent) do not currently use floating groundline in their trawls. Fifty-six percent of these fishermen indicated that they have replaced

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<sup>7</sup> The requirement would be unlikely to affect the total amount of line in use, but would reduce the vertical profile of that line. Excess line would lie flat on the ocean floor, rather than float above it.

<sup>8</sup> Both fishermen and the NMFS Gear Research Team report that non-floating line is already in use by some fishermen in certain areas from Maine through Rhode Island. Fishermen may prefer non-floating line for performance reasons or because they believe it reduces the chance of gear conflicts. To the extent that fishermen already use sinking and/or neutrally buoyant line, the incremental benefit of a regulatory provision requiring its use will be reduced.

<sup>9</sup> Using a variety of indicators that are likely to correlate with reduced entanglement risk to Atlantic large whales, the alternatives can be compared quantitatively. Further discussion of these quantitative risk reduction indicators is presented in section 5.1.3 of this chapter.

floating groundline within the last three years. Based on these results and communication with the inshore lobster trap/pot industry, MADMF reports that the majority of their inshore lobstermen are switching over to sinking and/or neutrally buoyant groundline (note that MADMF uses the term negatively buoyant). Additionally, MADMF is partnering with other groups on a gear exchange program to provide Massachusetts commercial lobstermen with financial assistance (federal grant) to purchase “negatively buoyant” groundline to reduce the risks of North Atlantic right whales becoming entangled in state coastal waters. Eligible Massachusetts lobstermen would turn in their old polypropylene line, which would then be recycled. Lobstermen would then be issued a voucher, which they may use to purchase new “negatively buoyant” line at a participating distributor (fishermen will be required to pay for a portion of the line). MADMF expects that the switch-over to “negatively buoyant” groundline through this program may occur as early as spring 2005. The early changeover is also likely to continue to occur particularly in the Northeast as fishermen respond to gear modifications required by the implementation of the SAM and DAM programs, which require the seasonal or temporary use of non-floating groundline. Some fishermen in this area may already choose to fish with SAM and DAM-compliant gear year round, or at least during the months when the DAM program is most likely to be triggered, rather than having to change their gear over or remove it when a DAM zone is established. If these scenarios come into play, there may be increased protection from entanglement in groundlines to large whales even earlier than 2008.

*Indirect effects:*

The potential indirect effect of requiring groundline to be composed of non-floating line is unclear. The key consideration is whether the requirement would increase or decrease the quantity of gear lost during commercial fishing operations. Lost gear – commonly called ghost gear – can pose a potential long-term entanglement risk to large whales. All else equal, an increase in the quantity of gear lost at sea could pose an increase in the risk of entanglement; a decrease in the quantity of gear lost at sea could have the opposite effect.

The NMFS Gear Research Team believes that the use of non-floating groundline may increase the frequency with which gear becomes snagged on rocks or other marine debris; this is of particular concern in areas where the sea floor is extremely rocky (e.g., Maine's inshore lobster fishery). If the line snags on a rock or other obstacle, it may break as it is hauled to the surface, resulting in the loss of gear. Conversely, the Gear Research Team notes that the use of non-floating groundline could diminish the likelihood of gear conflicts that occur when different fishermen set trawls in close proximity to one another, since it would eliminate arcs of floating line in the water column that can become intertwined. Such conflicts often lead to a loss of gear, either because fishermen cut the entangling line in an attempt to recover their own gear or because fouled gear is dragged from its original location when one of the lines is hauled. To the

extent that the use of non-floating groundline would decrease the frequency of such conflicts, it would reduce gear loss.<sup>10</sup>

The relative effect of these potential impacts is unknown. In light of this uncertainty, the analysis takes a precautionary approach and assumes that requiring the use of non-floating groundline could increase the rate of gear loss for trap/pot fishermen.<sup>11</sup> To the extent that this is the case, the increase in the quantity of ghost gear could add to the risk of large whales becoming entangled. The risks associated with an increase in gear loss, however, are likely to be outweighed by the benefits gained by reducing the vertical profile of groundline in the water column. Overall, therefore, the effect of the sinking and/or neutrally buoyant groundline requirement is expected to be a reduction in entanglement risks.

### 5.1.1.2 Buoy Line Requirements

Like groundline, buoy line (i.e., line that is directly connected from a flotation device to gillnet or trap/pot gear) has been identified as a potential entanglement threat to Atlantic large whales.<sup>12</sup> Data on the quantity of buoy line currently used by the gillnet, lobster trap/pot, and other trap/pot fisheries in waters potentially subject to ALWTRP regulations are unavailable. The economic analysis presented in Chapter 6, however, is based in part on estimates of the amount of buoy line typically used by vessels in these fisheries, as well as the number of active vessels in each fishery. Using these figures, it is possible to develop an overall estimate of the amount of buoy line these vessels employ. Exhibit 5-8 presents these estimates. As the exhibit indicates, vessels in the fisheries of interest are estimated to employ more than 30 million fathoms of buoy line. Approximately 52 percent of this line is assumed to be floating line. The remainder (48 percent) of the buoy line is assumed to be sinking and/or neutrally buoyant line, which is used in certain areas (e.g., by lobster trap/pot vessels and gillnet vessels in the SAM zone) to comply with current ALWTRP requirements, but is also frequently used on the upper portion of buoy lines independent of regulatory requirements. The estimate for the lobster trap/pot fishery accounts for approximately 93 percent of the buoy line currently in use. The remainder is accounted for by gillnet fisheries (1 percent) and other trap/pot fisheries (6 percent).

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<sup>10</sup> In addition to the issues noted above, some fishermen have raised concerns that the use of non-floating groundline would make it more difficult to grapple for and recover gear when buoy lines are lost. In 2003, the NMFS Gear Research Team conducted a study to determine whether this would be the case in Mid-Atlantic waters, which are largely devoid of extreme hard bottom. The study found that the use of sinking and/or neutrally buoyant line rather than floating line had no impact on gear recovery in areas where the sea floor is consistent with Mid-Atlantic conditions. Investigation of this issue in areas characterized by different bottom conditions is ongoing; however, it is likely that the use of sinking and/or neutrally buoyant groundline will prove more problematic when grappling for lost gear in hard bottom areas.

<sup>11</sup> This assumption is consistent with that employed in the economic impact analysis (see Chapter 6).

<sup>12</sup> "Endline" is an alternative term for buoy line.

<b>Exhibit 5-8</b>			
<b>ESTIMATED QUANTITY OF BUOY LINE IN USE</b> (thousands of fathoms)			
<b>Fishery</b>	<b>Floating Line</b>	<b>Sinking and/or Neutrally Buoyant Line</b>	<b>Total</b>
Lobster trap/pot	14,557	13,772	28,329
Gillnet	206	106	312
Other trap/pot	1,284	642	1,926
<b>TOTAL</b>	<b>16,047</b>	<b>14,521</b>	<b>30,568</b>
Note: Columns and rows may not sum to reported totals due to rounding error.			

Alternatives 2 through 6 incorporate several provisions pertaining to buoy lines that may reduce the frequency or severity of whale entanglements: (1) universal gear modification requirements; (2) non-floating line requirements; and (3) restrictions on the number of buoy lines that certain fishermen can employ. The following discussion examines the potential direct and indirect effects of these provisions.

*Direct effects:*

Under current regulations, all fisheries subject to ALWTRP requirements must comply with the universal gear modification standard, which prohibits the use of gillnet or trap/pot gear that at any time has any portion of the buoy line floating at the surface. The universal gear modification standard also encourages (but does not require) fishermen to keep buoy lines as knot-free as possible.<sup>13</sup>

Alternatives 2 through 6 would extend the universal gear modification requirement to several additional fisheries in ALWTRP-regulated waters (as specified in the List of Fisheries, 68 FR 41725):

- the Atlantic blue crab trap/pot fishery;
- the Atlantic mixed species trap/pot fishery;
- the Northeast anchored float gillnet fishery; and
- the Southeast Atlantic gillnet fishery.<sup>14</sup>

<sup>13</sup> In addition to the buoy line provisions noted above, the universal gear modification standard requires fishermen to haul their gear at least once every 30 days. This provision is designed to reduce the risks associated with "wet storage" of gear, the practice of leaving gear in the water even when it is not being actively fished. Prohibiting wet storage of gear would reduce the overall amount of gear in the water, particularly gear that is not checked regularly. Thus, the wet storage prohibition would provide a direct benefit to large whales by decreasing the likelihood of an entanglement.

<sup>14</sup> Alternatives 2 and 4 would also require the Mid-Atlantic anchored gillnet fishery to comply with the universal gear modification standard year-round; Alternatives 3 (Preferred), 5, and 6 (Preferred) would require the Mid-Atlantic anchored gillnet fishery to comply with this requirement on a seasonal basis (September 1 through May 31).

The extension of the universal gear modification requirement to these fisheries may benefit large whales by reducing the frequency or severity of entanglement in buoy lines and associated gear. For example, the elimination of floating buoy line at the surface could be of significant benefit to North Atlantic right whales, which often skim-feed at the surface. Similarly, the use of knot-free lines could diminish the likelihood that line would become lodged in baleen or around appendages, thus hindering natural and/or directed disentanglement efforts.<sup>15</sup>

Alternatives 2 through 6 would also mandate that certain vessels subject to the requirements of the ALWTRP use non-floating buoy line. This requirement is designed to reduce entanglement risks by reducing the amount of line in the water column and floating at the surface.<sup>16</sup> Specifically:

- Alternatives 2 through 4 would maintain existing standards for lobster trap/pot gear in the Cape Cod Bay Restricted Area from January 1 through May 15, requiring the use of sinking and/or neutrally buoyant line on the upper two-thirds of all buoy lines. These alternatives would also extend this requirement to other trap/pot gear. In addition, other trap/pot gear in the SAM zone would be required to comply with the standards currently applicable to lobster trap/pot gear and anchored gillnets from March 1 through July 31, mandating the use of buoy lines made entirely of sinking and/or neutrally buoyant line; this requirement, however, would be eliminated for all fisheries in 2008 with the elimination of the SAM program.
- Like Alternatives 2 through 4, Alternative 5 would maintain existing buoy line standards for lobster trap/pot gear in the Cape Cod Bay Restricted Area and extend this requirement to other trap/pot gear. In addition, it would require other trap/pot gear in the SAM zone from March 1 through July 31 to comply with buoy line standards for the SAM program. However, it would modify these standards to allow the lower third of all buoy lines to employ floating line. Since the SAM program would not be eliminated under this alternative, the buoy line requirement in SAM waters would remain in effect beyond 2008.
- Like the alternatives discussed above, Alternative 6 (one of two Preferred) would maintain existing buoy line standards for lobster trap/pot gear in the Cape Cod Bay Restricted Area and extend this requirement to other trap/pot gear. In addition, it would require other trap/pot gear in the SAM

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<sup>15</sup> To the extent that fishermen in previously unregulated fisheries already follow these practices, the incremental benefit of regulations requiring knot-free lines will be reduced.

<sup>16</sup> To the extent that fishermen already employ non-floating buoy line, the incremental benefit of regulations requiring its use will be reduced. For example, in areas with high boat traffic, fishermen may already use non-floating buoy line to avoid conflicts between vessels and gear. Therefore, the reduction in entanglement risks associated with a regulation that requires the use of non-floating buoy line would be less in this case because some fishermen already use this type of line.



zone from March 1 through July 31 to comply with buoy line standards for the SAM program. However, it would modify these standards to allow the lower third of all buoy lines to employ floating line. In 2008, the SAM program would terminate, and the buoy line requirements associated with it would be eliminated.

As noted above, the standards in some instances would require the use of non-floating material throughout the buoy line's entire length, but in others would require its use only along the upper two-thirds of the line. Consideration of this approach is based upon information provided by the Massachusetts Division of Marine Fisheries and underwater video footage taken by NMFS, which demonstrates that using polypropylene (floating) line on the bottom third of the buoy line typically produces a similar profile to that of 100% sink and 100% neutrally buoyant configured lines (Lyman and McKiernan, 2004). Therefore, it seems that the use of floating line on the bottom third of the buoy line does not appreciably change the profile of line in the water column, and thus will not increase the risk that large whales will become entangled. In addition, allowing the use of floating line on the lower third of the buoy line would help to ensure that the buoy line remains above the rest of the gear, thereby preventing fouling with obstacles on the bottom and reducing gear loss.

As an additional measure of protection, the alternatives analyzed would in several cases institute restrictions designed to reduce the number of buoy lines that fishermen employ. For example, Alternatives 2 through 4 would limit other trap/pot gear in the Cape Cod Bay Restricted Area from January 1 through May 15 to a two-trap string that can have only one buoy line, or to trawls of four or more traps/pots (single traps and three-trap trawls are prohibited). These alternatives would also (1) prohibit the use of single traps/pots in Northern Nearshore waters, Stellwagen Bank/Jeffrey's Ledge, and in Federal waters of Cape Cod Bay from May 16 to December 31; (2) prohibit the use of more than one buoy line on trawls of four or fewer traps in Northern Nearshore waters, Stellwagen Bank/Jeffrey's Ledge, and in Federal waters of Cape Cod Bay from May 16 to December 31; and (3) set a limit of one buoy line per trawl in SAM restricted waters until 2008, when SAM provisions would be eliminated. Alternatives 5 and 6 would set similar requirements, except that trawls set in SAM restricted waters would be allowed two buoy lines per trawl except in areas where SAM restricted waters overlap with Northern Nearshore waters and Stellwagen Bank/Jeffrey's Ledge. In these areas, the prohibition on single traps and the limit of one buoy line for trawls of four or fewer traps would continue to apply.

In the case of other trap/pot fisheries, these restrictions would represent new requirements. In each case, the provision is designed to reduce the amount of buoy line in the water column, and thus directly reduce the risk of large whale entanglement. Similar requirements would apply to lobster trap/pot gear. In this case, however, the provisions would constitute a continuation or revision of existing lobster fishery requirements, rather than the application of an entirely new standard. For example, current ALWTRP regulations for the Northern Nearshore and Stellwagen Bank/Jeffrey's Ledge lobster fishery, and for the Federal waters of Cape Cod Bay (May 16 through December 31) allow only one buoy line on trawls of five or fewer traps. Thus, the change in the standard incorporated in Alternatives 2 through 6 – prohibiting the use of more than one buoy line on trawls of *four* or fewer traps – represents a relaxation of current requirements. In this case, however, consideration of a change is motivated by reports received during the comment period on the DAM proposed rule and during the

ALWTRP EIS scoping process that the existing requirement has prompted fishermen to split their trawls, thus *increasing* the number of buoy lines in the water (68 FR 51195). In light of these reports, NMFS is considering allowing trawls with five traps or more to use two buoy lines, in the belief that the net result would be an overall *decrease* in the amount of buoy line employed, thereby reducing entanglement risks.

With the exception of Alternative 1 (No Action), all of the alternatives under consideration would eliminate the existing requirement that lobster trawls or gillnet strings in SAM waters use no more than one buoy line.<sup>17</sup> In the case of Alternatives 5 and 6, this requirement would be eliminated six months after promulgation of the rule; under Alternatives 2, 3, and 4, the requirement would end in 2008, when the SAM program would be eliminated. Although this change has the potential to increase the amount of buoy line in use in SAM waters (as currently defined), consideration of this change is motivated by concerns that requiring the use of a single buoy line may encourage lobstermen to split their trawls, thus increasing the number of buoy lines in the water. In addition, requiring the use of a single buoy line may increase the risk of gear loss (due to gear conflicts, for example), thus increasing the entanglement risks associated with ghost gear (see below). In light of these factors, NMFS believes that elimination of the current requirement could potentially decrease entanglement risks in the SAM zone.<sup>18</sup>

#### *Indirect effects:*

The indirect effects of the requirements described above depend upon whether they would result in an increase in gear loss, with a resulting increase in the risk that whales may become entangled in ghost gear. Non-floating buoy line, for example, is considered more susceptible than floating line to becoming entangled in other gear as a result of tidal action. If a buoy line becomes wrapped around a trap or tangled in a trawl as the tide ebbs and flows, the line may break, resulting in gear loss. To avoid this effect, Alternatives 2 through 6 would not require the use of sinking and/or neutrally buoyant line along the entire length of the buoy line beyond 2008. Allowing the use of floating line on the lower third of the buoy line would help to ensure that the buoy line remains above the rest of the gear, thereby preventing fouling with changes in tide and avoiding an increase in the risks associated with ghost gear.<sup>19</sup>

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<sup>17</sup> In areas of the SAM zone that overlap with Northern Nearshore waters and Stellwagen Bank/Jeffrey's Ledge, the prohibition on single traps and the limit of one buoy line for trawls of four or fewer traps would continue to apply.

<sup>18</sup> NMFS believes that further research is necessary before it proposes additional measures to reduce the risks associated with vertical lines. Such research is currently underway (e.g., investigation of the profile of vertical line with different buoy line configurations, and evaluation of the impact of requiring a minimum number of traps per trawl in certain areas). NMFS plans to discuss the results of this research and its implications at a future meeting of the Atlantic Large Whale Take Reduction Team (ALWTRT). The information developed through this process will provide a basis for considering broad-based options for the regulation of vertical line as part of future rulemaking actions.

<sup>19</sup> As an additional consideration, NMFS is concerned that a requirement to use non-floating material over the entire length of the buoy line would encourage fishermen to use "toggle buoys" or small gillnet floats to raise the buoy line off the bottom to prevent it from fouling. The use of a toggle or float in this manner could pose a threat to whales, since the toggle or float could become lodged in the baleen of an entangled whale. Allowing the use of

It is unclear whether or not the buoy line restrictions described above would lead to an overall increase in gear loss. In the case of other trap/pot fisheries, new restrictions on the number of buoy lines employed could increase the loss of gear to vessel traffic, bad weather, or gear conflicts. In contrast, the relaxation of existing restrictions for the lobster trap/pot fishery could reduce gear loss rates, particularly in SAM waters, where trawls would no longer be restricted to a single buoy line.<sup>20</sup> Given the relatively large size of the lobster trap/pot fishery, the overall impact of the set restrictions under consideration seems likely to be a decrease in gear loss. As a result, these changes could help to reduce the potential for whales to become entangled in lost gear.

### 5.1.1.3 Weak Link and Anchoring Requirements

The potential regulatory changes analyzed include provisions requiring that lobster and other trap/pot gear employ weak links on all buoy lines. Specifically:

- Alternative 2 would maintain existing requirements for lobster trap/pot gear mandating that buoy lines be attached to the main buoy with a weak link, and would extend these requirements to waters between 35°30'N and 27°51'N, as well as to the small portion of Lobster Management Area 6 (Long Island Sound) that is not included in exempted waters and is not currently covered by the ALWTRP. In addition, it would require that weak links be placed on all flotation and/or weighted devices attached to the buoy line, such as surface buoys and toggles. In nearshore or inshore trap/pot waters, including the Great South Channel Restricted Area that overlaps with LMA 2 and the Outer Cape LMA, weak links with a breaking strength of 600 lb. would be required.<sup>21</sup> In offshore trap/pot waters, including the Great South Channel Restricted Area that overlaps with LMA 2/3 Overlap and LMA 3 between July 1 and March 31, the

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floating line on the bottom portion of the buoy line could eliminate the need for toggle buoys, and thus avoid an inadvertent increase in entanglement risks.

<sup>20</sup> Where the SAM zone overlaps with Northern Nearshore waters and Stellwagen Bank/Jeffrey's Ledge, trawls of four traps or fewer would be restricted to a single buoy line. This provision is in keeping with requirements that would apply in all Northern Nearshore waters and Stellwagen Bank/Jeffrey's Ledge under regulatory Alternatives 2 through 6.

<sup>21</sup> Gear research indicates that a 600 lb weak link will provide a measure of protection for whales, as well as keep gear operational and prevent ghost gear in this area. The 600 lb weak link requirement has been in effect since February of 2001 in the Northern Nearshore Lobster Waters Area, with very few problems reported. The NMFS Gear Research Team has conducted research on the strain on inshore buoy systems on the Outer Cape. Buoys were towed up to 20 knots and a 120 lb strain was recorded. Load cells were attached to large buoy systems in Grand Manan Channel, known for its strong tides (approx. 18 to 20 ft (5.49 m to 6.09 m)), and a 140 lb strain was recorded in the spring. NMFS cautions that while the strain recorded on buoy systems can indicate whether or not a particular weak link breaking strength is appropriate, the recorded strains alone cannot dictate weak link breaking strengths, as reasonable safety measures must be included that would prevent gear from being lost under unfavorable conditions.

breaking strength on buoys would be reduced from 2,000 lb. to 1,500 lb.<sup>22</sup> Requirements identical to those for lobster trap/pot gear would be extended to other trap/pot fisheries that would be newly regulated under the ALWTRP.<sup>23</sup> These requirements would apply year-round.

- Alternatives 3 (Preferred), 5, and 6 (Preferred) would establish similar requirements on lobster and other trap/pot gear, but would impose them on a year-round basis only in waters north and east of a line extending from Watch Hill, Rhode Island (41°18.2' N and 71°51.5' W) south to 40°00' N, then east to the boundary of the Exclusive Economic Zone (EEZ). From this area south to the South Carolina/Georgia border, the requirements would be in effect from September 1 through May 31. Between the South Carolina/Georgia border and 29°00' N latitude, the requirements would be in effect from November 15 through April 15. Finally, between 29°00' N and 27°51' N, the requirements would apply from December 1 through March 31.
- Alternative 4 would impose the requirements identified above on a year-round basis north of the South Carolina/Georgia border. South of this area, the seasonal standards specified under Alternatives 3 (Preferred), 5, and 6 (Preferred) would apply.

Alternatives 2 through 6 would also require the incorporation of weak links into gillnet gear. In certain areas, the weak link requirements for anchored gillnets would be coupled with the specification of minimum anchoring strength standards. Specifically:

- Alternative 2 would require that the buoy lines of anchored gillnet gear be attached to the main buoy with a weak link having a maximum breaking strength of 1,100 lb. This standard would be expanded to require that weak links be placed on all flotation and/or weighted devices attached to the buoy line, such as surface buoys and toggles. In addition, Alternative 2 would mandate changes in the number and placement of weak links within net panels. In the Northeast anchored gillnet fishery, the following net panel weak link requirements would apply: each net panel would require five or more weak links, depending on panel size<sup>24</sup> (rather than

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<sup>22</sup> This is a result of testing conducted by NMFS with the offshore lobster industry that suggests that the breaking strength on the buoy line could be lowered while still allowing the gear to be used effectively.

<sup>23</sup> An exception to this requirement is being proposed for the red crab fishery. This fishery is typically conducted at depths in excess of 2,000 feet, with individual trawls consisting of up to 200 traps. The buoy lines required to set and haul this gear must be able to withstand significant loads. As a result, the buoy lines use rope that is both larger in diameter and length than other offshore trap/pot fisheries, and require the support of a more buoyant surface system. Therefore, a 1,500 pound weak link requirement may not provide an adequate human safety factor for this fishery. The maximum breaking strength of weak links on the buoy line will be lowered from 3,780 lb, as currently required in the Final Rule implementing the Red crab Fishery Management Plan, to 2,000 lb.

<sup>24</sup> The weak link requirements apply to all variations in panel size. For all variations in panel size, the following weak link requirements would apply: 1) weak links must be placed in the center of each of the up and

one), and all nets would be secured at each end of the net string with the minimum holding power of a 22 pound Danforth-style anchor. Similar requirements would apply to the Mid-Atlantic anchored gillnet fishery and to the Southeast gillnet fishery north of 27°51' N, except that, in these areas, the minimum anchoring standard and the requirement that net panels employ five or more weak links would not apply to gillnets that return to port with the vessel; gillnets that return to port with the vessel would instead be required to incorporate a single 1,100 pound weak link into each net panel. Alternative 2 would also extend weak link requirements to the driftnet fishery in the Northeast and Mid-Atlantic; in this case, vessels fishing with tended gear<sup>25</sup> at night would be required to incorporate one 1,100 pound weak link into each net panel. Each of these standards would be effective year-round.

- Alternatives 3 (Preferred) and 6 (Preferred) would establish similar requirements, but would require them on a year-round basis only in waters north and east of a line extending from Watch Hill, Rhode Island (41°18.2' N and 71°51.5' W) south to 40°00' N, then east to the boundary of the EEZ. From this area south to the South Carolina/Georgia border, the requirements would be in effect from September 1 through May 31. Between the South Carolina/Georgia border and 29°00' N latitude, the requirements would be in effect from November 15 through April 15. Finally, between 29°00' N and 27°51' N, the requirements would apply from December 1 through March 31.
- Alternative 4 would establish the requirements identified above on a year-round basis north of the South Carolina/Georgia border. South of this area, the seasonal standards specified under Alternatives 3 (Preferred), and 6 (Preferred) would apply.
- Alternative 5 would require that the buoy lines of anchored gillnet gear be attached to the main buoy with a weak link having a maximum breaking strength of 1,100 lb. It would expand this standard to require that weak links be placed on all flotation and/or weighted devices attached to the buoy line, such as surface buoys and toggles. These requirements would apply on a year-round basis in waters north and east of a line extending from Watch Hill, Rhode Island (41°18.2' N and 71°51.5' W) south to 40°00' N, then east to the boundary of the EEZ. From this area south to the South Carolina/Georgia border, the requirements would be in effect

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down lines at both ends of each net panel; and 2) one floatline weak link must be placed as close as possible to each end of the net panel just before the floatline meets the up and down line. Also, for net panels of 50 fathoms or less in length, one floatline weak link must be placed at the center of the net panel, and for net panels greater than 50 fathoms, weak links must be placed continuously along the floatline separated by a maximum distance of 25 fathoms. The breaking strength of each of these weak links must not exceed 1,100 lb (498.9 kg).

<sup>25</sup> Tended gear or tend is defined in 50 CFR 229.2 to mean fishing gear that is physically attached to a vessel in a way that is capable of harvesting fish, or to fish with gear attached to the vessel.

from September 1 through May 31. Between the South Carolina/Georgia border and 29°00' N latitude, the requirements would be in effect from November 15 through April 15. Finally, between 29°00' N and 27°51' N, the requirements would apply from December 1 through March 31. In addition, Alternative 5 would maintain current minimum anchoring standards and net panel weak link requirements within SAM waters, expanding these requirements to areas newly incorporated into the SAM program. Alternative 5 would also extend the minimum anchoring standards and net panel weak link requirements that currently apply on a seasonal basis in the Mid-Atlantic Coastal Waters Area to the Southeast gillnet fishery north of 27°51' N latitude.

All of the requirements described above are designed to reduce the likelihood that interactions between whales and commercial fishing gear will result in entanglements that cause serious injury or mortality. The following discussion further explores the potential direct and indirect effects of these standards.

*Direct effects:*

The direct effect of incorporating weak links into buoy lines or gillnet panels is believed to result in a reduction in the number of interactions between whales and commercial fishing gear that result in a serious entanglement. As described below, the specified strength and placement of weak links is designed to increase the likelihood that if a large whale does become entangled, the whale would be able to exert enough force to break the weak link.<sup>26</sup> Thus, the risk of entanglement, and subsequent serious injury or mortality, would be reduced. Across Alternatives 2 through 6, approximately 30,600,000 fathoms of buoy line would incorporate weak links installed on all flotation and/or weighted devices (see Exhibit 5-11 in section 5.1.3.2). In addition, the *number* of weak links installed on all flotation and/or weighted devices off the main buoy line would be approximately 346,000 across Alternatives 2 through 6. However, there are differences among alternatives for incorporating weak links into gillnet panels. For example, under Alternative 5 the number of gillnet panels with five or more weak links installed would be approximately 2,100 compared to approximately 125,000 under Alternatives 2 through 4 and 6. In contrast, the number of gillnet panels with one weak link installed under Alternative 5 would be approximately 118,600, whereas, this number decreases to approximately 60,000 under Alternatives 2 through 4 and 6.

As previously noted, buoy lines have been identified as a source of entanglement risk, in part because the presence of an obstacle like a buoy makes it more difficult for a whale to free itself from line wrapped around an appendage or lodged in its mouth. The weak link requirement is specifically designed to reduce entanglements and serious injury due to

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<sup>26</sup> NMFS has worked with several gear manufacturers to develop weak links for the lobster trap/pot and gillnet fisheries. The specifications of breaking strengths incorporated in Alternatives 2 through 6 are based upon stress analyses of buoy systems conducted by the NMFS Gear Research Team, including several years of at-sea testing from Maine to North Carolina in both inshore and offshore fisheries.

entanglements in, and around, the mouth, and in buoy lines and surface systems. Thus, if a buoy, toggle, or weighted device is not attached to the buoy line with a weak link, a buoy line that becomes entangled through the mouth of a whale may be prevented from passing through the whale's baleen, and may result in a more complicated entanglement. Adding a weak link on all devices attached to the buoy line increases the likelihood that a line sliding through a whale's mouth will break away quickly at the buoy before the whale begins to thrash and become more entangled.

The rationale for incorporating weak links in gillnet panels is similar. As detailed above, Alternatives 2 through 6 each include provisions that require certain gillnets to incorporate from one to five or more weak links per net panel, depending on panel size. When one weak link per net panel is specified, the regulations would require that the weak link be placed in the center of each net panel's floatline.<sup>27</sup> The 1,100 lb. weak link in the center of the floatline of each net panel would be expected to break when a whale exerts pressure in opposition to the resistance provided by the net's weight and anchoring system.<sup>28</sup> The weak links would allow the line to part and unravel from the net mesh when a whale encounters any section of the gear. The net mesh would then be free of the stronger floatline, and a large whale would have a better chance of breaking free of the weaker monofilament mesh. The incorporation of additional weak links into each net panel could further increase the likelihood that a whale would be able to free itself from being entangled in a gillnet without sustaining serious injury.<sup>29</sup> Moreover, should some gear remain attached to a whale after the initial encounter, the chance that it would be shed by the whale or removed through subsequent disentanglement efforts would increase.

As detailed above, Alternatives 2 through 6, to varying degrees, would require anchored gillnets to be secured with the holding power of at least a 22-pound (9.9 kg.) Danforth-style anchor at each end of the net string. This requirement is designed to ensure that if a whale encounters the anchored gear, the tension placed on the line would be sufficient to cause the weak link to break. The combination of net panel weak links and anchors should increase the

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<sup>27</sup> Recent research indicates that placing weak links in the center of each net panel's floatline, rather than between gillnet panels or at the gillnet's bridle, will decrease entanglement risks (Smolowitz and Wiley, 1998). Links that part at the bridle or between net panels may leave a long section of net and line intact, presenting a continued risk of entanglement.

<sup>28</sup> New floatline with a diameter of 5/16" – 3/8" typically has a breaking strength of 1,700 – 2,700 pounds. The 1,100 lb. breaking strength incorporated in current ALWTRP regulations was initially specified in NMFS' 1997 interim final rule (62 FR 39157) and was recommended as a "best available practice" by the Gear Advisory Group (GAG). NMFS has conducted gillnet research with 1,100 lb. (498.9 kg.) and 600 lb. (272.2 kg.) weak links. The broad geographic area covered by the ALWTRP includes physical environments that require that the 1,100 lb. (498.9 kg.) breaking strength be maintained. NMFS will continue gear research to determine the lowest possible value that will allow fishing to continue safely and provide a higher probability that an entangled animal will be able to free itself in the event of an entanglement.

<sup>29</sup> When five or more weak links per net panel, depending on panel size, are required, the weak link requirements apply to all variations in panel size. For all variations in panel size the following weak link requirements would apply: 1) weak links must be placed in the center of each of the up and down lines at both ends of each net panel; and 2) one floatline weak link must be placed as close as possible to each end of the net panel just before the floatline meets the up and down line. Also, for net panels of 50 fathoms or less in length, one floatline weak link must be placed at the center of the net panel, and for net panels greater than 50 fathoms, weak links must be placed continuously along the floatline separated by a maximum distance of 25 fathoms.

likelihood that a whale would be able to break free of the gear it encounters.<sup>30</sup> An exception to this requirement would be allowed in certain cases (see above) if gillnets return to port with the vessel. This exception considers those gillnets in the Mid- and South Atlantic, which may be anchored with insufficient holding power but which are well-tended, and are required to be returned to port with the vessel, thus reducing the likelihood of entanglements in such gear. It is also NMFS' belief that if an entanglement were to occur in such gear while it is being hauled, or in the event that the gear is hung up on the bottom, there would be sufficient resistance on the gear to allow the weak link to part as designed. Additionally, if an entanglement were to occur, the fishermen tending the gear would be able to report it as soon as possible. When comparing alternatives, the number of additional gillnet strings with anchors installed would be less than 100 under Alternative 5. For Alternatives 2 through 4 and 6, the number of additional gillnet strings with anchors installed would be approximately 2,900 compared to Alternative 1 (No Action) (see Exhibit 5-11 in section 5.1.3.2). Thus, Alternative 5 would provide less reduction in entanglement risk than the other alternatives under consideration, excluding Alternative 1 (No Action).

*Indirect effects:*

Gear research indicates that the installation of weak links is unlikely to increase the rate of gear loss, and thus is unlikely to increase the risk that whales could become entangled in ghost gear. Several weak link requirements have been implemented under previous ALWTRP initiatives, and the NMFS Gear Research Team reports that they have received few comments regarding problems with the failure of any of these devices. NMFS' Gear Research Team has been collecting information on gillnet gear being fished with the above configuration of weak links in the Northeast since the summer of 2001. In Maine, net panels with these configurations (no floating line, anchoring power of a 22-lb Danforth-style anchor on each end of the net string, and five 1,100 lb weak links) have been fished in 15-net strings in the same manner as unmodified nets in both the 12-25 mile offshore and 80-100 mile offshore range. Areas fished with this gear include the Great South Channel Sliver Area, Jeffreys Ledge, Cashes Ledge and Platts Bank, the Outer Falls, and the edge of the Davis Swell. Conditions included extremes in current, tides, and weather. The five weak link-configured nets displayed no problems other than those consistent with traditionally rigged gillnets in the Gulf of Maine. Since the spring of 2003, the NMFS Gear Research Team has also been collecting information on gillnet gear being fished with the above configuration of net panel weak links in the Mid-Atlantic. Load cell data collected on vessels while hauling gear in the Mid-Atlantic indicate loads similar to those recorded in New England (approximately 250 to 500 lb (113.4 to 226.8 kg)). In the waters off of

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<sup>30</sup> In order to evaluate the effectiveness of weak links placed in the floatline of anchored gillnets, NMFS conducted investigations simulating an entanglement. NMFS placed strain on fifteen net strings that were anchored and twenty that were not anchored. Trials were run with both 600 lb. (272.2 kg.) and 1,100 lb. (498.9 kg.) weak links at three places on the floatline. When strain was applied to the gillnets with proper anchoring systems, the floatline weak link broke with very little net attached. This provides evidence that weak links can be expected to break when encountering strain such as that placed on them by a marine mammal. The fact that the weak link broke quickly and cleanly provides evidence that an encounter between a whale and gillnet gear with proper anchoring would reduce the risk of entanglement.



Maryland and Virginia, these nets have been fished close to shore as well as between 12 to 15 nautical miles (22.2 to 27.8 km) offshore. The above configured nets displayed no problems other than those consistent with traditionally rigged gillnets in the Mid-Atlantic. In addition, the NMFS Gear Research Team has conducted a series of research projects to test the amount of strain placed on buoy systems when used in typical conditions at different locations; all tests have confirmed that weak links at the required breaking strength should not contribute to any significant additional gear loss (Kenney, 2003).<sup>31</sup>

#### 5.1.1.4 Set Restrictions and Gear Stowing Requirements

The potential regulatory changes under analysis include several restrictions on the use of gillnet gear:

- *Northeast and Mid-Atlantic* – Alternatives 2 and 4 would prohibit the use of driftnet gear at night in Northeast and Mid-Atlantic waters unless the gear is tended, and would require that all such gear set by a vessel be removed from the water and stowed on board the vessel before it returns to port. These regulations would be in effect year-round. Alternatives 3 (Preferred), 5, and 6 (Preferred) would institute similar requirements on a year-round basis in waters north and east of a line extending from Watch Hill, Rhode Island (41°18.2'N and 71°51.5'W) south to 40°00'N, then east to the boundary of the EEZ; south and west of this area, the regulations would only be in effect from September 1 through May 31.
- *Southeast Atlantic* – In Southeast waters, Alternatives 2 through 6 would establish seasonal prohibitions on straight sets of gillnet gear at night, and similar prohibitions on the use of strikenets<sup>32</sup> at night or when visibility is less than 500 yards. These restrictions would be in effect from November 15 through April 15 in waters between the South Carolina/Georgia border and 29°00' N; and from December 1 through March 31 in waters between 29°00' N and 27°51' N for Southeast gillnet fisheries, and in waters between 29°00' N and 26°46'.5 N for Southeast shark gillnet fisheries. Note that the eastern boundary for these areas is the EEZ.

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<sup>31</sup> In addition to the information provided above, the NMFS Gear Research Team notes the possibility that the use of weak links could decrease the amount of gear that is lost due to gear conflicts. For example, if snagged gear parts at a weak link, it is less likely to be dragged away from where it was originally set, thus increasing the chance that the gear will be recovered. This observation is supported by the experience of several Maine fishermen, who have reported that weak links on buoy systems allowed buoys to pop off when trawlers towed through their gear. Although weak links were not designed for such purposes, the fishermen involved believe that their presence in this case prevented their gear from being towed away and permanently lost. In these situations, the fishermen were able to recover all of their gear and avoid the creation of additional ghost gear.

<sup>32</sup> Strikenet or to fish with strikenet gear is defined in 50 CFR 229.2 to mean a gillnet that is designed so that, when it is deployed, it encircles or encloses an area of water either with the net or by utilizing the shoreline to complete encirclement, or to fish with such a net and method.

As explained further below, these requirements are designed to reduce the risk that large whales will become entangled in gillnet gear.

*Direct effects:*

The provisions noted above would contribute directly to the protection of Atlantic large whales. The night set restrictions under consideration are designed to reduce the risk that poor visibility would contribute to an entanglement; the prohibition on the use of strikenets when visibility is less than 500 yards has a similar purpose. The use of driftnets in the fisheries of the Northeast or Mid-Atlantic, the use of strikenets in Southeast waters, or the use of straight sets of gillnet gear in the Southeast during the day is likely to pose a minimal risk to large whales, since such gear is actively tended and could be readily retrieved should a whale approach. When visibility is poor, however, fishermen may not realize that a whale is in the vicinity, and thus may fail to react in time to avoid an entanglement. In light of this consideration, a prohibition on operations when visibility is restricted would reduce the risk of entanglement. Under Alternatives 3 through 6, approximately 44 additional vessels would be affected for night set restrictions, and under Alternative 2 approximately 56 vessels would be affected compared to the status quo (Alternative 1, No Action). The additional 12 vessels under Alternative 2 are likely a result of year-round regulations (see Exhibit 5-11 in section 5.1.3.2). Given available data on the seasonal distribution of whale populations, however, the implementation of year-round requirements would offer limited additional conservation value to Atlantic large whales when compared with seasonal requirements.

The requirement that driftnet vessels in the Northeast and Mid-Atlantic remove their gear from the water and stow it on board before returning to port is designed to ensure that any interactions between driftnets and whales would be observed and reported in a timely fashion, allowing a response to be mounted as soon as possible. Driftnet vessels fishing in the Mid-Atlantic between December 1 and March 31 are already required to stow their nets onboard when returning to port; thus, the potential change under consideration would simply extend the requirement to vessels operating in the Mid-Atlantic during periods that were not previously regulated, to vessels operating in the newly extended Mid-Atlantic restricted area (see Chapter 3), and to vessels operating in the Northeast. These changes would in large part codify current fishing practices; since driftnets are not anchored and can drift with the current, they are rarely left untended for an extended period of time and are unlikely to be left in the water when a vessel returns to port. Nonetheless, this requirement could help to reduce entanglement risks, both by ensuring that current practices are adhered to and by guaranteeing that these practices do not change. Under Alternatives 3, 5, and 6, approximately 604 vessels would be newly affected by gear stowing restrictions, and under Alternatives 2 and 4 approximately 614 vessels would be newly affected by these restrictions when compared to the status quo (Alternative 1, No Action) (see Exhibit 5-11 in section 5.1.3.2). The additional 10 vessels under Alternatives 2 and 4 are likely a result of year-round regulations in the Mid-Atlantic. As previously stated, the implementation of year-round requirements would offer limited additional conservation value to Atlantic large whales when compared with seasonal requirements.

*Indirect effects:*

Any indirect effects associated with the above-noted restrictions on gillnet use are likely to be positive. In particular, because the restrictions limit activity when visibility is poor and prohibit affected fishermen from leaving their gear unattended while their vessels return to port, the restrictions may reduce gear loss, thus benefiting large whales by reducing the risk of entanglement in ghost gear.

#### **5.1.1.5 Gear Marking**

With the exception of Alternative 1 (No Action), all of the regulatory alternatives under consideration would apply new gear marking requirements. According to preliminary estimates, there would be no difference in gear marking requirements among Alternatives 2 through 6 (see Exhibit 5-11 in section 5.1.3.2). The gear marking provisions are designed to improve NMFS' ability to identify the gear involved in an entanglement. As discussed below, these provisions would have no immediate direct impact on entanglement risks. In the long run, however, they may help NMFS to target and improve its efforts to protect large whales.

##### *Direct effects:*

Alternatives 2 through 6 would remove most of the ALWTRP's current gear marking requirements. In place of the current standards, gillnet, lobster trap/pot, and other trap/pot vessels would be required to identify buoy lines with a four-inch mark every 10 fathoms, and to mark all surface buoys with a vessel or permit number. The current requirements for marking shark gillnet panels would remain in place; however, shark gillnet vessels would not be required to mark buoy lines that are four feet or less in length.<sup>33</sup>

The regulatory provisions described above would have no direct impact on the probability of whales becoming entangled in commercial fishing gear, nor would they affect the severity of an entanglement should one occur. As noted below, however, potential changes in gear marking requirements could have an indirect effect on whale entanglement risks.

##### *Indirect effects:*

A critical issue in understanding the nature of large whale entanglements is obtaining information about the gear involved. Currently, gear removal from entangled animals provides the only reliable information about the nature of entanglements (Johnson et al., 2005). However, it is often difficult to connect the gear that a whale becomes entangled in with a particular fishery because entangled whales often carry only a portion of the gear encountered and disentangling efforts sometimes recover only some of the remaining gear. The gear marking requirements under consideration would help to generate information on the nature of the gear involved in an

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<sup>33</sup> The gear marking provisions under consideration would not require groundlines to be marked. As gear marking technology improves, NMFS may require groundlines to be marked in the future.

entanglement. In addition, these provisions would in some cases allow NMFS to identify the owner of the gear, and thus allow the agency to gather additional information on where, when, and how the gear was set. By increasing scientific understanding of the nature of large whale entanglements, gear marking measures would allow NMFS, over time, to improve the effectiveness of the ALWTRP. Thus, these measures are expected to contribute indirectly to the preservation and restoration of whale stocks.

The ALWTRP's current gear marking requirements extend only to gillnet and lobster trap/pot gear, and provide for only a single four-inch mark on buoy lines midway in the water column. By extending gear marking requirements to other trap/pot gear, Alternatives 2 through 6 would improve NMFS' ability to identify the gear involved in an entanglement. In addition, by requiring that buoy lines bear a mark every 10 fathoms, the revised standards would increase the chances of identifying fragments of line that may be visible on or recovered from an entangled whale. Similarly, by requiring that buoys have a vessel or permit number, the revised standards would increase the probability that NMFS could identify the gear involved in an entanglement, and thus pursue additional information on the circumstances that led to the event. The use of marks like these, which may be able to be identified from a distance or through photographs, would be particularly valuable for cases in which the gear involved in an entanglement cannot be recovered (Johnson et al., 2005).

An additional indirect benefit might result from potential changes to shark gillnet marking requirements. Unlike other gillnet fisheries regulated under the ALWTRP, shark gillnets do not employ a standard buoy line; instead, one short line is used between the float line of the gear and the high-flyer. The revised gear marking standards would only apply to such lines if their lengths exceed four feet. To avoid the cost of complying with the gear marking requirement, shark fishermen might choose to employ shorter lines, thus further reducing entanglement risks to whales.<sup>34</sup>

### **5.1.2 Impacts from Changes to Restricted Times and Areas**

In addition to gear modification requirements, the potential changes to the ALWTRP include a range of restrictions on the location and timing of fishing activity. The discussion below addresses the direct and indirect effects of the following provisions:

- the expansion of the SAM zone under Alternatives 5 and 6;
- seasonal closures of newly regulated fisheries in restricted areas;
- expansion of the geographic scope of the ALWTRP in the Mid-Atlantic and Southeast, coupled with changes in the periods of time during which ALWTRP regulations in the Southeast areas would apply, as well as renaming of the Southeast U.S. Observer and Southeast U.S. Restricted Areas;<sup>35</sup>

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<sup>34</sup> The benefits associated with any such impact are likely to be small, since shark vessels typically use buoy lines no more than four feet long. In most cases, longer lines are used only during inclement weather.

<sup>35</sup> Under Alternatives 2 through 6, for shark gillnet fisheries, the portion of the Southeast U.S. Restricted Area overlapping the Southeast U.S. Observer Area north of 27°51' N would be renamed the "Northern Monitoring

- changes to exempted waters in the Northeast and Mid-Atlantic;
- deep water exemptions;
- extension of the SAM and Dynamic Area Management (DAM) programs to additional fisheries; and
- the inclusion of seasonal restrictions on fishing activity in the Southeast and/or Mid-Atlantic.

#### **5.1.2.1 Expanded SAM Under Alternatives 5 and 6**

The SAM program was established to protect predictable seasonal aggregations of North Atlantic right whales in the waters off Cape Cod and eastward to the boundary of the Exclusive Economic Zone. As defined under current regulations, the program includes two areas, called SAM West and SAM East, and specifies time periods for each (March 1 through April 30 and May 1 through July 31, respectively) during which gear modifications for lobster trap/pot and anchored gillnet gear are more stringent than those otherwise required for the same gear under the ALWTRP. The dividing line between SAM West and SAM East is 69°24' W longitude. The SAM areas adjoin but do not include the Cape Cod Bay Critical Habitat area or the Great South Channel Critical Habitat area.

The current boundaries of the SAM areas were defined based on aerial survey data collected from 1999 through 2001 (Merrick et al., 2001), as well as the methods of Clapham and Pace (2001). Since implementation of the SAM program, however, additional information on the distribution of right whales in the Gulf of Maine, including new aerial survey data, has been obtained. In addition, repeated DAM triggers in some areas suggest that the current SAM areas do not encompass all predictable seasonal aggregations of North Atlantic right whales in waters north of 40°00' N latitude. In light of this information, both Alternative 5 and Alternative 6 (Preferred) propose to change the boundaries of the SAM areas.

The proposed change in boundaries is based upon two analyses conducted by the Northeast Fisheries Science Center (NEFSC). The first used spring (March through May) sightings data from 1999 to 2003 to assess whether the current SAM West and SAM East areas encompass all areas where right whales regularly congregate at that time of year. The methods employed in this analysis were similar to those used to define the original SAM areas (Merrick et al., 2001). Briefly, right whale sightings that met the DAM trigger criteria - 3 right whales and sufficient density (Clapham and Pace, 2001) - were identified. A core area was defined and mapped around each qualifying sighting. A buffer zone with a radius of 15 nautical miles was placed around each core, and the sightings with their buffer zones were overlaid. The second

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and Restricted Area,” and the portion of the Southeast U.S. Observer Area south of 27°51' N, would be renamed the “Southern Monitoring Area.” For non-shark gillnet fisheries, the waters north of 27°51' N, where gillnetting occurs, would be designated as “Other Southeast Gillnet Waters.” To avoid confusion in comparing current regulatory requirements to those under each alternative, this document retains the original nomenclature.

analysis considered March to July sightings data collected from 1975 to 2003 in the area between 40°00' N latitude and 45°00' N latitude from the Hague Line westward to the New England coast (or 73°00' W longitude). The defined area was subdivided into a grid, counts of individual right whales were summed by month for each grid cell, and the sum was divided by the cell's area. These normalized values were plotted and the monthly plots compared to help identify/verify areas where right whales seasonally congregate. The results of the analyses reflect basic knowledge of right whale distribution in the Gulf of Maine; whales occur at relatively high densities within Cape Cod Bay in March and April, then move eastward as the spring and summer progress. However, the additional survey data indicate that: (1) right whales regularly occur in March and April north of the Cape Cod Bay Critical Habitat and west of the existing SAM West, (2) right whales regularly occur south of SAM West and west of the Great South Channel Critical Habitat, (3) right whales are still present in SAM West in May (when SAM-related gear modifications are no longer required), and (4) there are very few or no sightings in the southeast corner of the SAM East area.

Based on these results, Alternatives 5 and 6 propose to modify the existing coordinates for the SAM areas. The revised SAM West would continue to adjoin the Cape Cod Bay Critical Habitat, but the western boundary of SAM West would be extended westward to encompass seasonal aggregations of right whales that occur north of the Cape Cod Bay Critical Habitat<sup>36</sup>. Similarly, the southern boundary of SAM West would be extended further south, adjoining the Great South Channel Sliver area, to encompass seasonal aggregations of right whales that occur south of SAM West and west of the Great South Channel Critical Habitat. Finally, the southern boundary of SAM East would be revised to include the Great South Channel Critical Habitat Area,<sup>37</sup> but would exclude the southeast corner of the existing SAM East area where there have been very few right whale sightings. The western boundary of SAM East would be extended west to encompass right whales that might remain in SAM West in May (after the SAM West area restrictions have expired). As a result, the western boundary of SAM East would shift westward to 69° 45' W longitude for the May-July period.

The changes described above would take effect within six months of the promulgation of new ALWTRP requirements. Under Alternative 6 (one of two Preferred), however, SAM requirements would remain in effect only until 2008. The program would be eliminated in that year, when the broad-based gear modification requirements mandated under Alternative 6 (one of two Preferred) would come into effect.

#### *Direct effects:*

Under Alternatives 5 and 6, the proposed expansion of the SAM zone would allow the DAM program to be eliminated six months after publication of the rule. The area to be incorporated into the expanded SAM zone would encompass many of the areas that previously

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<sup>36</sup> The Cape Cod Bay Critical Habitat Area includes ALWTRP management areas for trap/pot and gillnet gear (both called the Cape Cod Bay Restricted Area).

<sup>37</sup> The Great South Channel Critical Habitat Area includes ALWTRP management areas for trap/pot (Great South Channel Restricted Trap/Pot Area) and gillnet gear (Great South Channel Restricted Gillnet Area and Great South Channel Sliver Restricted Areas).

have been designated DAM zones, as well as other areas that have a high potential to receive such designation. In light of these considerations, NMFS believes that replacement of the DAM program with an expanded SAM program would increase the amount of protection afforded to right whales. In addition, NMFS believes that expanding the SAM zone would provide greater protection to right whales in the Northeast during times of predictable spring aggregations. In particular, the new overlap of SAM East and SAM West would provide a direct benefit to right whales in this area during the month of April, when the number of right whales in the vicinity is expected to be high. Expansion of the SAM zone under Alternatives 5 and 6 (Preferred) is expected to regulate an additional 25 vessels in this area (see Exhibit 5-11 in section 5.1.3.2) as compared with Alternatives 1 through 4.

As noted in the discussion of gear modification requirements, Alternatives 5 and 6 would eliminate the existing requirement that lobster trap/pot trawls or gillnet strings in SAM waters use no more than one buoy line.<sup>38</sup> In addition, SAM requirements would be modified to allow floating line in the lower one-third of the buoy line. Although these changes have the potential to increase the amount of buoy line in use in SAM waters (as currently defined), consideration of these changes is motivated by concerns that the current requirements may increase the risk of gear loss, and thus increase the entanglement risks associated with ghost gear. In addition, the current requirement mandating use of a single buoy line may encourage lobstermen to split their trawls, thus increasing the number of buoy lines in the water. In light of these factors, NMFS believes that the elimination of the current requirements may decrease entanglement risks in the SAM zone.

*Indirect effects:*

Alternative 5 does not include expanded broad-based gear requirements coast-wide, and would only impose these gear restrictions within the expanded SAM zone during specified time periods. For the designated SAM areas, the same is true of Alternative 6 until 2008, when coast-wide, broad-based gear modification requirements would take effect and the SAM program would be eliminated. In each case, however, it is possible that fishermen who modified their gear to comply with SAM requirements would also use that gear in other areas and/or other seasons. To the extent this occurred, the SAM program would provide an ancillary benefit, affording whales a greater degree of protection than the regulations require.

### **5.1.2.2 New Fishery Closures in Restricted Areas**

With the exception of Alternative 1 (No Action), each of the regulatory alternatives under consideration would expand the scope of the ALWTRP to include the Atlantic mixed species

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<sup>38</sup> Where the SAM zone overlaps with Northern Nearshore waters and Stellwagen Bank/Jeffrey's Ledge, trawls of four traps/pots or fewer would be restricted to a single buoy line. This provision is consistent with requirements that would apply in all Northern Nearshore waters and Stellwagen Bank/Jeffrey's Ledge under Alternatives 2 through 6.

trap/pot fishery, the Northeast anchored float gillnet fishery, and the Northeast driftnet fishery.<sup>39</sup> The newly-regulated fisheries would be subject to prohibitions on fishing activity in restricted areas.<sup>40</sup> Specifically, fishermen would be prohibited from using gillnet gear inside the Cape Cod Bay Restricted Area from January 1 through May 15, trap/pot gear inside the Great South Channel Restricted Trap/Pot Area from April 1 through June 30, or gillnet gear inside the Great South Channel Restricted Gillnet Area from April 1 through June 30.<sup>41</sup>

*Direct effects:*

NMFS believes that the closure of the Great South Channel Trap/Pot Restricted Area to other trap/pot fishing from April 1 to June 30 would have a beneficial impact on whale entanglement risks, as would seasonal prohibitions on driftnet and anchored float gillnet fishing in the Cape Cod Bay Restricted Area and the Great South Channel Restricted Gillnet Area. In each case, however, the impacts are likely to be minor. In the Northeast, very few vessels use driftnets or anchored float gillnets, and there is no indication that vessels using such gear have been active in the Cape Cod Bay Restricted Area or the Great South Channel Restricted Gillnet Area during the periods of interest. Vessel activity data show some use of other trap/pot gear in the Great South Channel Restricted Trap/Pot Area from April 1 to June 30, but this activity is extremely limited. As a result, the seasonal closure of these areas to other trap/pot fishing and/or driftnet and anchored float gillnet fishing is likely to have a small but beneficial impact on whale entanglement risks.

*Indirect effects:*

The provisions noted above could have indirect beneficial effects on large whales by tempering the possible expansion of the Northeast driftnet, anchored float gillnet, or other trap/pot fisheries. Any vessels entering into these fisheries would be subject to the seasonal closure of the restricted areas.

### **5.1.2.3 Changes to Mid-Atlantic and Southeast Restricted Areas and Times**

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<sup>39</sup> The Atlantic blue crab trap/pot fishery would also become subject to ALWTRP requirements. This fishery, however, does not extend far enough north to be affected by seasonal closures of the restricted areas addressed here.

<sup>40</sup> The restricted areas encompass both Cape Cod Bay and the Great South Channel, which NMFS has designated as critical habitat for North Atlantic right whales. These areas are also important feeding habitats for humpback and fin whales.

<sup>41</sup> The prohibition on gillnet fishing in the Great South Channel Critical Habitat Area would apply only to the Great South Channel Restricted Gillnet Area. Gillnet fishing would be permitted year-round in the Great South Channel Sliver Restricted Area; gillnet gear used in this area would be required to be compliant with all applicable ALWTRP regulations.



Current ALWTRP regulations specify standards for the use of gillnets within the Mid-Atlantic Coastal Waters Area and the Southeast U.S. Observer and Restricted Areas. Under Alternatives 2 through 6, for shark gillnet fisheries, the Southeast U.S. Restricted Area (which overlaps with the portion of the Southeast U.S. Observer Area north of 27°51' N) would be renamed the “Northern Monitoring and Restricted Area,” and the portion of the Southeast U.S. Observer Area south of 27°51' N would be renamed the “Southern Monitoring Area.” For non-shark gillnet fisheries in the Southeast, the waters north of 27°51' N would be designated as “Other Southeast Gillnet Waters.” To avoid confusion in comparing current regulatory requirements to those that would apply under each alternative, this document retains the original nomenclature.

Alternatives 2 through 6 would extend the eastern boundary of these areas (and thus the regulations that apply therein) to the limits of the EEZ. In addition, they would revise the time period during which regulations in the Southeast U.S. Observer and Restricted areas would apply. Specifically:

- Alternatives 2 through 6 would extend the eastern boundary of the Southeast U.S. Restricted Area to the limits of the EEZ and modify the periods during which this area is closed to shark gillnet fishing (except strikenetting). Under current regulations, the closure extends from November 15 through March 31. Under the revised regulations, the closure would extend from November 15 through April 15 in waters between the South Carolina/Georgia border and 29°00' N, and from December 1 through March 31 in waters between 29°00' N and 27°51' N.
- Alternatives 2 through 6 would also modify requirements for the use of spotter planes by vessels strikenetting for sharks within the Southeast U.S. Restricted Area. Under current regulations, provisions for the use of spotter planes extend from November 15 through March 31. Under the revised regulations, these provisions would be applicable from November 15 through April 15 in waters between the South Carolina/Georgia border and 29°00' N, and from December 1 through March 31 in waters between 29°00' N and 27°51' N.
- Alternatives 2 through 6 would modify whale approach regulations for shark gillnet vessels within the Southeast U.S. Restricted Area. Current regulations stipulate that vessels strikenetting for sharks within this area during the restricted period (November 15 through March 31) may not set their nets within three nautical miles of a right, humpback, or fin whale, and must remove gear from the water immediately if a right, humpback, or fin whale approaches within three nautical miles of it.<sup>42</sup> Under Alternative 2, these requirements would apply to shark net gear year-round between the South Carolina/Georgia border and 27°51' N. Under Alternatives 3

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<sup>42</sup> NMFS believes that a three-mile approach limit gives fishermen ample time to remove their gear from the water before an entanglement can occur (62 FR 39157).

through 6, the requirements would take effect from November 15 through April 15 in waters between the South Carolina/Georgia border and 29°00'N, and from December 1 through March 31 in waters between 29°00'N and 27°51'N.

- Alternatives 2 through 6 would remove requirements for observer coverage within the Southeast U.S. Observer Area (including the Southeast U.S. Restricted Area). Under current regulations, provisions for the use of an observer apply to the use of shark nets (both strikenets and driftnets) from November 15 through March 31 in Atlantic waters south of the South Carolina/Georgia border, west of 80°00'W, and north of 26°46.5'N. The revised regulations would replace the requirements for observer coverage with a requirement to employ an automated Vessel Monitoring System (see “Direct effects” below). The area of coverage would be extended east to the boundary of the EEZ. In addition, the revised regulations would change the dates of coverage to November 15 through April 15 for shark nets in waters between the South Carolina/Georgia border and 29°00' N, and to December 1 through March 31 for shark nets in waters between 29°00' N and 26°46.5' N.

*Direct effects:*

Gillnet vessels in the Southeast and Mid-Atlantic do not typically fish in the area that would be newly regulated by the ALWTRP, nor are gillnet vessels in the Southeast typically active during periods that would be newly subject to ALWTRP requirements.<sup>43</sup> As a result, the changes described above would be unlikely to have a major or immediate impact on protected whales. NMFS is considering these changes primarily to ensure that ALWTRP requirements would be in place to address any expansion of current fishing activity. Should such expansion occur, the revised standards would provide the following benefits:

- **Increased whale protection through better enforcement** – The EEZ is an existing, well understood boundary. Extending ALWTRP requirements eastward to the limits of the EEZ would make consistent enforcement of ALWTRP regulations easier to attain, and thus enhance efforts to protect whales.
- **Increased spotter plane coverage** – Expansion of the Southeast U.S. Restricted Area eastward to the boundary of the EEZ would increase the size of the region within which vessels strikenetting for sharks must obtain

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<sup>43</sup> As previously described in Section 5.1.1.3 “Weak Link and Anchoring Requirements,” and section 5.1.1.4 “Set Restriction and Gear Stowing Requirements,” Alternatives 2 through 6 propose changes to the timing of requirements for gillnet vessels in the Mid-Atlantic and Southeast. See these sections for discussion regarding the timing of requirements in these areas.

spotter plane coverage. With increased aerial surveillance, the likelihood of spotting right whales would increase. Spotter planes may help identify and monitor the positions of right whale calves and their mothers, and report any entanglements in fishing gear. The identification of an entangled or injured large whale would allow for possible disentanglement and/or tagging efforts to be coordinated.<sup>44</sup>

- **Increased protection through automated vessel monitoring** – As the result of Amendment 1 to the Highly Migratory Species Fishery Management Plan, shark gillnet vessels operating in the Southeast U.S. Observer Area are required to employ automated vessel monitoring systems (VMSs). Alternatives 2 through 6 would allow for the VMS to be used rather than rely upon onboard observers to enforce the Southeast U.S. Observer Area.<sup>45</sup> The VMS will allow NMFS to more accurately monitor and enforce time and area closures. Thus, NMFS believes that incorporating the use of a VMS program would benefit large whales protected by the ALWTRP, and will be more effective than observer coverage of the shark gillnet fishery to monitor and enforce the time and area closure in the Southeast U.S. Observer Area.<sup>46</sup>
- **Increased protection for late-migrating whales** – Extending spotter plane and VMS requirements through the first half of April in waters between the South Carolina/Georgia border and 29°00' N would provide protection for large whales that linger in the Southeast region longer than expected before migrating north.<sup>47</sup>
- **Increased protection for whales that approach gear** – Implementing current whale approach requirements on a year-round basis within the Southeast U.S. Restricted Area (Alternative 2), or modifying the time during which these requirements are in effect to better correspond to periods when endangered whales are likely to be present (Alternatives 3 through 6) would help to reduce the risks of entanglement in shark gillnet gear.

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<sup>44</sup> Although not part of the mission of the ALWTRP, additional spotter plane coverage may also help to reduce the occurrence of ship strikes. Ship strikes are a major concern in the conservation of large whales, particularly right whales. Spotter planes can assist in observing vessel traffic in proximity to whales and can report sightings of both whales and vessels to the Early Warning System (EWS).

<sup>45</sup> Although observer coverage would no longer be mandatory, sufficient coverage would be maintained to provide statistically significant data on the fishery's take of protected species.

<sup>46</sup> The primary purpose of the observer program is to observe catch, not to enforce regulations. The collection of information on marine mammal interactions with the shark gillnet fishery is a secondary benefit of the observer program.

<sup>47</sup> A review of right whale sightings data from the North Atlantic Right Whale (NARW) Sightings Database indicates that some individuals remain longer in the Southeast than others.

NMFS does not believe that the changes described above would have any adverse impact on the preservation or restoration of whale stocks. In developing these potential revisions to the ALWTRP, NMFS analyzed large whale sightings data obtained from the North Atlantic Right Whale (NARW) Sightings Database, which includes all large whale sightings collected on all right whale surveys, and is curated by the University of Rhode Island (URI), for the Southeast. These data indicate that revising the period of time that the Southeast U.S. Restricted Area would be closed to shark gillnet fishing should not put right whales at risk. The revised closure times coincide with historical observations of right whale presence and movement, and thus should be protective of right whales.<sup>48</sup>

*Indirect effects:*

The regulatory changes outlined above could have a number of indirect effects that would enhance protection of whales. For example:

- Increased spotter plane coverage may result in earlier identification of concentrations of right whales in offshore waters.
- Replacement of the current observer program with a VMS requirement will reduce NMFS' oversight costs for the shark gillnet fishery by a minimum of \$100 thousand annually; these funds will be used to extend the observer program to other high priority fisheries in the Southeast for which observer coverage has been lacking.

#### **5.1.2.4 Changes to Exempted Waters**

The ALWTRP currently exempts certain bays, harbors, inlets, and other coastal waters from the provisions of the plan (see Chapter 2). Alternatives 2 through 6 would expand these areas to include all waters landward of the 72 COLREGS demarcation line (International Regulations for Preventing Collisions at Sea, 1972), as depicted or noted on nautical charts published by NOAA (Coast Charts 1:80,000 scale), and as described in 33 CFR part 80, with the exception of Boston Harbor, Gardiners Bay, and portions of the Maine coast, in which NMFS would create a different exemption line (see Chapter 3). NMFS would continue to monitor all exempted areas, and encourage states to develop contingency plans in the event a large whale is sighted in such areas. These potential changes have been developed in response to requests from state fishery management agencies, as well as others, and are designed to ensure that the

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<sup>48</sup> Current ALWTRP regulations for the shark gillnet fishery between the South Carolina/Georgia border and 26°46.5' N are in effect from November 15 to March 31. Alternatives 3 (Preferred), 4, and 6 (Preferred) would modify this approach, making the requirements applicable from November 15 through April 15 between the South Carolina/Georgia border and 29°00' N, and from December 1 through March 31 between 29°00' N and 26°46.5' N. Consideration of this change is based on data indicating that right whales are rarely sighted south of 29°00' N latitude from November 1 to November 15 (n=1) or from April 1 to April 15 (n=3), but may occur sporadically throughout the area north of 29°00' N latitude from April 1 to April 15.

ALWTRP does not unnecessarily extend commercial fishing regulations to waters in which endangered or protected whales have been rarely, if ever, observed.

*Direct effects:*

In developing potential changes to the specification of exempted waters, NMFS reviewed the NARW Sightings Database, as well as a large whale sightings database compiled by Maine Department of Marine Resources, for data on right, fin, and humpback whale sightings from 1960 to 2002. The areas that would be newly exempted from ALWTRP requirements include only those in which whales are unlikely to be found, as suggested both by NMFS' review of the data and its current understanding of whale behavior.<sup>49</sup> Therefore, exempting these areas from ALWTRP regulations is believed to be unlikely to have significant direct effects on endangered or protected whales.

*Indirect effects:*

Exempting certain areas from ALWTRP regulations may encourage fishermen to shift their activity to those areas. If this were to result in a decrease in fishing activity in areas that whales are more likely to frequent, it would help to reduce entanglement risks.<sup>50</sup>

Improved targeting of ALWTRP regulations might also increase support for their implementation within the commercial fishing community. Fishermen are more likely to comply with restrictions on their operations when they understand that those restrictions serve a beneficial purpose. Requiring fishermen to comply with ALWTRP requirements where whales are unlikely to be encountered can undermine belief in the need for the requirements, and may ultimately undermine compliance with the plan in other areas. To the extent that the designation of exempted areas makes clear that ALWTRP regulations are designed to apply where the chances of an entanglement are real, it may foster improved compliance, and thus indirectly assist in preserving and restoring endangered or protected whale species.

#### **5.1.2.5 Deep Water Exemptions**

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<sup>49</sup> The sightings data indicate some observations of large whales inside currently exempted waters (e.g., in Georgia) or waters that would be newly exempted (e.g., portions of Delaware Bay). NMFS' review of the data, however, suggests that these occurrences are rare.

<sup>50</sup> It is also possible that fishermen who modify their gear to comply with ALWTRP requirements would use the same gear in exempted areas. To the extent this occurred, whales would experience a greater degree of protection than the regulations require.

The ALWTRP currently requires lobster trap/pot vessels to use sinking and/or neutrally buoyant groundline in the Cape Cod Bay Restricted Area from January 1 to May 15. In addition, lobster trap/pot gear and gillnet gear set in the SAM zone during designated times (or in a DAM zone when a DAM gear modification is in effect) must employ sinking and/or neutrally buoyant groundline (amongst other requirements).

As previously described, Alternatives 2 through 6 would expand the non-floating groundline requirement, in most cases making the use of sinking and/or neutrally buoyant groundline mandatory on a seasonal or year-round basis in all waters covered by the ALWTRP. Each of these alternatives, however, would provide an exemption for gear that is fished at depths greater than 280 fathoms. As explained below, this exemption is unlikely to have an adverse impact on entanglement risks.

*Direct effects:*

The large whales discussed here (right, humpback, fin, and minke) are not known to commonly dive to depths greater than 275 fathoms (502.9 meters). Thus, providing an exemption that allows the use of floating groundline when gear is fished at depths greater than 280 fathoms – providing a five fathom margin of safety to account for the vertical profile of excess groundline in the water column – is unlikely to pose a risk of entanglement.

A review of vessel trip reports for 2002 further supports the conclusion that the proposed deep water exemption would not materially affect entanglement risks. The trip report data indicate that vessels targeting red crab are the only vessels that consistently fish at depths greater than 280 fathoms; the review identified only 18 instances (in more than 47 thousand trips) in which a lobster trap/pot or gillnet vessel reported fishing at depths greater than 280 fathoms. Given the relatively limited fishing activity in these waters, the risk of an entanglement associated with the use of floating groundline at depths of greater than 280 fathoms is likely to be remote.<sup>51</sup>

*Indirect effects:*

As noted above, requiring fishermen to comply with ALWTRP requirements in situations where the risks of entanglement are remote can undermine belief in the need for the requirements, and may ultimately undermine compliance with the plan in other areas. To the extent that allowing the use of floating groundline in waters deeper than 280 fathoms makes clear that ALWTRP regulations are designed to apply where the chances of an entanglement are genuine, it may foster improved compliance with the other provisions of the plan, and thus indirectly assist in preserving and restoring stocks of endangered and/or protected whales.

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<sup>51</sup> It is also important to note that the red crab fishery is not currently required to employ sinking and/or neutrally buoyant groundline, and that none of the instances in which lobster trap/pot or gillnet vessels reported fishing at depths of greater than 280 fathoms occurred in waters currently subject to such requirements. Thus, allowing the continued use of floating groundline in these cases would simply preserve the status quo; it would not constitute an *increase* in entanglement risks relative to current conditions.

### 5.1.2.6 Extension of SAM and DAM Programs to Additional Fisheries

As previously described, regulatory Alternatives 2 through 6 would expand the scope of the ALWTRP to include the Atlantic mixed species trap/pot fishery and the Northeast anchored float gillnet fishery.<sup>52</sup> Under Alternatives 2, 3 (Preferred), and 4, these fisheries would be subject to the requirements of the SAM and DAM programs until 2008, when both programs would be eliminated. Under Alternative 5, these fisheries would become subject to the requirements of the expanded SAM program (the DAM program would be eliminated six months following promulgation of the rule). Finally, under Alternative 6 (Preferred), these fisheries would be subject to the requirements of the expanded SAM program until 2008, when the program would be eliminated (the DAM program would be eliminated six months following promulgation of the rule).

#### *Direct effects:*

Regulation of additional fisheries under the SAM and DAM programs is likely to have a direct effect on the protection and restoration of Atlantic large whales, providing measures to reduce the risk of entanglement when aggregations of whales are known or likely to be present. Under several alternatives (see above), these measures would cease to be in effect after 2008. In these cases, however, the SAM and/or DAM programs would be replaced by a more broadly based gear modification program. In the interim, the combination of groundline, buoy line, and weak link modifications required by the SAM and DAM programs would afford additional protection to large whales, with direct and indirect impacts similar to those described in the relevant sections above. Under Alternatives 5 and 6, an additional 25 vessels would be regulated under the expansion of the SAM zone compared to Alternatives 1 through 4 (see Exhibit 5-1 in section 5.1.3.2). Under Alternatives 2 through 4, approximately 265 additional vessels would be regulated under the DAM program (until 2008) compared with the status quo (Alternative 1). No additional vessels would be regulated under Alternatives 5 and 6 since the DAM program would be eliminated within six months after promulgation of the rule.

#### *Indirect effects:*

The inclusion of additional fisheries in the SAM and DAM programs could provide indirect benefits to whales if vessels newly subject to SAM and/or DAM gear requirements extended the use of gear that meets SAM or DAM standards to other areas.

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<sup>52</sup> The Northeast driftnet fishery and the Atlantic blue crab trap/pot fishery would also become subject to ALWTRP requirements, but the former would not be subject to the SAM or DAM programs. The Atlantic blue crab trap/pot fishery would be subject to SAM and DAM requirements, but does not extend far enough north to be affected by the SAM program. Given its location (centered primarily in Chesapeake Bay), it is also unlikely to be affected by the DAM program.

### 5.1.2.7 Seasonal Regulation of Southeast and Mid-Atlantic Waters

A fundamental difference among Alternatives 2 through 6 is the extent to which broad-based gear modification requirements – i.e., sinking and/or neutrally buoyant groundline requirements, requirements concerning the use of multiple weak links in gillnet panels, and minimum gillnet anchoring requirements – would be imposed on fisheries in the Mid-Atlantic and Southeast. Alternative 5 would impose no such requirements, while Alternative 2 would impose these requirements year-round in both the Mid-Atlantic and Southeast. Alternatives 3 (Preferred) and 6 (Preferred) would also extend broad-based gear modification requirements to the Mid-Atlantic and Southeast, but would only do so on a seasonal basis: from September 1 through May 31 in the Mid-Atlantic, from November 15 through April 15 between the South Carolina/Georgia border and 29°00' N latitude, and from December 1 through March 31 in waters south of 29°00' N. In contrast, Alternative 4 would establish year-round gear modification requirements in the Mid-Atlantic, but would impose them on a seasonal basis in the Southeast: from November 15 through April 15 between the South Carolina/Georgia border and 29°00' N latitude, and from December 1 through March 31 in waters south of 29°00' N.<sup>53</sup>

Consideration of seasonal variation in gear modification requirements is based upon the understanding of seasonal differences in the geographic distribution of populations of endangered whales, as reflected in a recent NMFS analysis of whale sightings data based on the December 2003 version of the North Atlantic Right Whale (NARW) Sightings Database, which is maintained by the University of Rhode Island. This dataset includes a total of 21,977 right whale sighting records from the 18<sup>th</sup> century through 2003, as well as 4,414 humpback and 8,098 fin whale sighting records. The analysis provides the following information on the seasonal distribution of endangered whales:

- **Right Whales** – Right whale distribution has a strong seasonal aspect. The northern feeding areas are occupied primarily from May through September (although Cape Cod Bay is sometimes occupied from December on), with some right whales found in the area year-round. Right whales can be found in the Mid-Atlantic year-round, but sightings primarily occur between September and May. Right whales occupy the southern calving grounds (south of the South Carolina/Georgia border) from late November through early April, and these areas are largely unused for the remainder of the year. The greatest proportion of all right whale sightings occur in this region during the winter months, with virtually no sightings outside of this time period.<sup>54</sup>

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<sup>53</sup> The southern boundary of the southernmost area subject to ALWTRP requirements would be set at 27°51' N for trap/pot and Southeast gillnet fisheries, and at 26°46.5' N for shark net fisheries.

<sup>54</sup> However, within the Southeast region, the URI dataset shows that right whales rarely occur south of 29°00'N latitude until after November 15. Right whale sightings then expand south during December through February, and then north of 29°00'N again after early April, with more variable sightings in March. Thus, it is considered appropriate to regulate the areas south of the South Carolina/Georgia border on a rolling basis.



- **Humpback Whales** – The seasonal distribution of humpback whales is similar to that of right whales. Humpback whales are common in the Northeast year-round, but the northern feeding grounds are primarily occupied from June through August. Humpback whales are present in the Mid-Atlantic year-round, but sightings primarily occur between September and May. They are common in the Southeast only during the winter months (November through April).
- **Fin Whales** – There are virtually no sightings of fin whales in the Southeast or southern Mid-Atlantic (i.e., south of Cape Hatteras) during any month. They are commonly seen north of the Cape Hatteras year-round.

Exhibit 5-9 summarizes the results of this analysis. In light of this information, NMFS is considering standards that would be designed to protect whales when they are most likely to be present in Mid-Atlantic or Southeast waters, without imposing restrictions on fishermen in these areas when whales are not likely to be present.

*Direct effects:*

The application of broad-based gear modification requirements on a seasonal basis in Mid-Atlantic and/or Southeast waters, as envisioned under Alternatives 3 (Preferred), 4, and 6 (Preferred), is unlikely to have an adverse effect on the entanglement risks *currently* faced by large whales, since the seasonal variation in requirements would pertain to the implementation of new standards. Looking forward, the implementation of year-round rather than seasonal requirements would offer the most risk averse approach. Given available data on the seasonal distribution of whale populations, however, implementation of year-round requirements seem to offer limited additional conservation value compared to seasonal requirements. On a practical basis, seasonal requirements could offer the same degree of protection as year-round standards, without requiring fishermen to comply with restrictions on their operations when the chances of an entanglement are remote.

<b>Exhibit 5-9</b>			
<b>SEASONAL DISTRIBUTION OF ENDANGERED WHALE SPECIES</b>			
<b>Area</b>	<b>Right Whales</b>	<b>Humpback Whales</b>	<b>Fin Whales</b>
Northeast <sup>1</sup>	Common year-round; primarily from May through September	Common year-round; primarily from June through August	Common year-round
Mid-Atlantic <sup>2</sup>	Present year-round; primarily from September through May	Present year-round; primarily from September through May	Common year-round north of Cape Hatteras

Southeast <sup>3</sup>	Common from late November through early April	Common from November through April	Uncommon at any time
Notes: <sup>1</sup> Waters north of a line extending south from the Rhode Island – Connecticut border, then east at the 40 degree latitude line. <sup>2</sup> Waters south of the line described above and north of the South Carolina – Georgia border. <sup>3</sup> Waters south of the South Carolina – Georgia border.			

In summary, seasonality of the alternatives under consideration varies. Broad-based gear modifications would be imposed year-round under Alternative 2. Broad-based gear modifications would be placed seasonally on vessels fishing in the Mid- or South Atlantic waters under Alternatives 3 (Preferred) and 6 (Preferred) and would be placed seasonally on vessels fishing in the South Atlantic waters under Alternative 4. Quantitative risk reduction indicators reflect this seasonal variation. For example, the estimated number of trips subject to broad-based gear modifications in addition to the status quo (i.e., Alternative 1, No Action) is highest for Alternative 2 at 51,702, followed by 51,305 under Alternative 4, and 48,439 for Alternatives 3 (Preferred), 5, and 6 (Preferred) (see Exhibit 5-11 in section 5.1.3.2). As previously stated, given the migratory patterns of whales, year-round requirements would likely offer little incremental risk reduction relative to seasonal requirements.

*Indirect effects:*

As noted above, requiring fishermen to comply with ALWTRP requirements in situations where the risks of entanglement are low can undermine support for and compliance with the plan. Consideration of a seasonal approach to broad-based gear modification requirements – as envisioned under Alternatives 3 (Preferred), 4, and 6 (Preferred) – is motivated by data suggesting that year-round requirements in the Mid-Atlantic and Southeast may not be warranted. To the extent that implementing seasonal rather than year-round restrictions makes clear that ALWTRP regulations are designed to apply where and when entanglements are most likely, a seasonal approach may foster improved compliance with the plan as a whole, and thus indirectly assist in preserving and restoring stocks of endangered or protected whales.

It is possible that fishermen who modified their gear to comply with seasonal requirements would also use that gear when the requirements are not in effect. To the extent this occurred, the seasonal approach would provide an ancillary benefit, affording whales a greater degree of protection than the regulations require.

### **5.1.3 Comparison of Biological Impacts Across Regulatory Alternatives**

The biological impacts described in the previous section vary across the six regulatory alternatives. This section compares the direct and indirect biological impacts of each alternative. Where sufficient information is available, the alternatives are compared using quantitative criteria. The discussion is divided into two parts:

- First, it describes the criteria used to compare the direct and indirect impacts of each regulatory provision;
- Second, it compares the direct and indirect impacts across regulatory alternatives.

### 5.1.3.1 Comparison Criteria

As previously noted, the discussion of the biological impacts of new ALWTRP requirements on whale entanglement risks is largely qualitative. This approach is necessary because models that would enable NMFS to conduct a rigorous quantitative assessment of such risks are currently unavailable. In some instances, however, it is possible to develop quantitative indicators of the impact of alternative regulations.

Exhibit 5-10 summarizes the quantitative indicators developed to compare the biological impacts of the regulatory alternatives under consideration. As the exhibit shows, most of the indicators reflect changes in the number of vessels subject to ALWTRP requirements or changes in commercial fishing operations, such as increases in the quantity of low-risk gear used. These indicators do not measure changes in entanglement risks, but offer useful information on factors that may partially correlate with such risks.

The indicators listed in Exhibit 5-10 focus primarily upon measures of the direct effects of new ALWTRP regulations. None of the indicators address one of the potentially important indirect effects of changes in ALWTRP regulations: a change in gear loss associated with new groundline requirements, buoy line requirements, or weak link and anchoring requirements. Changes in the amount of gear that is lost may affect whale entanglement risks. This indirect effect is addressed qualitatively in a separate discussion.

In addition to excluding consideration of gear loss impacts, the list of quantitative indicators does not address the impacts of the following provisions:

- seasonal closures of newly regulated fisheries in restricted areas;
- expansion of the geographic scope of the ALWTRP in the Mid-Atlantic and Southeast, coupled with changes in the periods of time during which ALWTRP regulations in the Southeast would apply;
- changes to exempted waters in the Northeast and Mid-Atlantic; and
- deep water exemptions.

As previously noted, Alternatives 2 through 6 incorporate identical requirements on virtually all of these parameters.<sup>55</sup> Because the impact of Alternatives 2 through 6, with respect to these provisions is indistinguishable, they are excluded from the analysis.

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<sup>55</sup> The only difference in these parameters is that Alternative 2 would impose whale approach regulations on a year-round basis in the Southeast U.S. Restricted Area, while Alternatives 3 through 6 would impose these requirements seasonally.

Exhibit 5-10

Exhibit 5-10			
RISK REDUCTION INDICATORS			
Regulatory Provision		Impact	Risk Reduction Indicator
Major Gear Requirements			
Groundline <sup>1</sup>	Non-floating line requirement	Direct benefit to large whales by reducing the amount of fishing line in the water column.	Additional fathoms of groundline converted
Buoy line	Universal gear modifications	Direct benefit to large whales by reducing the amount of fishing line at the water surface.	Additional vessels required to comply
	Non-floating line requirement	See <i>SAM Program</i> and/or <i>Critical Habitat Areas</i> , below.	See <i>SAM Program</i> and/or <i>Critical Habitat Areas</i> , below.
	Single buoy line provision		
Weak links and anchoring	Weak links required at all flotation and/or weighted devices off the main buoy line	Direct benefit to large whales by increasing the number of effective breaking points in fishing gear.	Fathoms of buoy line with weak links installed on all flotation and/or weighted devices; number of additional weak links installed on all flotation and/or weighted devices
	Weak links required in all net panels (gillnet only)		Number of additional gillnet net panels with weak links installed
	Anchors required for all gillnet strings (gillnet only)		Number of additional gillnet strings with anchors installed
Set restrictions and gear stowing requirements	Night set restrictions (gillnet only)	Direct benefit to large whales by reducing the interaction between large whales and untended fishing gear at night.	Additional vessels required to comply
	Gear stowing requirements (gillnet only)	Direct benefit to large whales by reducing the interaction between large whales and untended fishing gear.	
	One buoy line per trawl of four traps or fewer <sup>2</sup>	Direct benefit to large whales by reducing the amount of buoy line in the water column.	
Gear marking	Marking of buoy lines	Indirect benefit to large whales by increasing the scientific understanding of the nature of large whale entanglements.	Number of new gear marks
Changes to Restricted Times and Areas			
Critical Habitat Areas	New fishery closures in Great South Channel (April 1 – June 30)	Direct benefit to large whales by decreasing the potential for interactions between large whales and fishing gear in critical habitat areas.	Additional vessels required to comply
	Gear requirements in Cape Cod Bay, (January 1 – May 15): <sup>3</sup> <ul style="list-style-type: none"><li>Prohibition on single pots</li><li>Non-floating buoy line requirement</li></ul>	Direct benefit to large whales by increasing the number of vessels that must comply with low-risk gear requirements, specifically by reducing the amount of buoy line in the water column and floating at the surface.	Additional vessels required to comply
			Additional fathoms of buoy line converted
SAM Program <sup>3</sup>	Revised SAM boundaries (under Alternatives 5 and 6)	Direct benefit to large whales by increasing the area of protection afforded to large whales.	Additional vessels subject to SAM program
	Inclusion of other trap/pot vessels in SAM program: <sup>4</sup> <ul style="list-style-type: none"><li>Non-floating buoy line requirement</li><li>Single buoy line provision</li></ul>	Direct benefit to large whales by reducing the amount of fishing line in the water column and floating at the surface.	Additional fathoms of buoy line converted
DAM Program <sup>5</sup>	Inclusion of other trap/pot vessels in DAM program: <sup>4</sup> <ul style="list-style-type: none"><li>Non-floating buoy line requirement</li></ul>	Direct benefit to large whales by increasing the number of vessels that must comply with low-risk gear requirements, specifically by reducing the amount of buoy line in the water column and floating at the surface.	Additional vessels required to comply
			Additional fathoms of buoy line converted
Seasonality			
Inclusion of seasonal alternatives		Direct benefit to large whales by increasing protection during times when whales are known to congregate in certain areas.	Total number of trips subject to low-risk gear requirements
			Area-days <sup>6</sup>
Notes:			
<sup>1</sup> This indicator addresses all groundline converted, including groundline converted pursuant to SAM or DAM program requirements.			
<sup>2</sup> This restriction is a requirement in Northern Nearshore waters, Stellwagen Bank/Jeffrey’s Ledge, and in areas of Cape Cod Bay that overlap with Northern Nearshore waters.			
<sup>3</sup> The SAM program is only effective until 2008 under Alternatives 2 through 4 and 6.			
<sup>4</sup> Only gear requirements that are unique to the SAM or DAM program are analyzed.			
<sup>5</sup> The DAM program would be eliminated in 2008 under Alternatives 2 through 4, and within six months of the promulgation of revised regulations under Alternatives 5 and 6.			
<sup>6</sup> This indicator is calculated by multiplying the square nautical miles of protected area by the number of days that seasonal gear modification requirements apply.			

### 5.1.3.2 Comparison of Regulatory Alternatives

#### Quantitative Risk Reduction Indicators

Exhibit 5-11 compares the impacts of Alternatives 2 through 6 using a variety of indicators that are likely to correlate with reduced entanglement risk to Atlantic large whales.<sup>56</sup> As the exhibit indicates, Alternative 5 is the only regulatory alternative that differs significantly from the others. The impacts associated with Alternative 5 would be significantly less than those associated with Alternatives 2-4 and 6, primarily because Alternative 5 would not impose as broad a set of gear modification requirements. In particular:

- Alternative 5 would not require vessels fishing outside Cape Cod Bay (January 1 to May 15) or the Seasonal Area Management zone (March 1 to July 1) to convert their groundline to sinking and/or neutrally buoyant line. In contrast, Alternatives 2, 3 (Preferred), 4, and 6 (Preferred) would require most vessels fishing in ALWTRP-regulated waters to convert to sinking and/or neutrally buoyant groundline. Under Alternative 5, the total groundline converted to non-floating line would be less than one percent of the total groundline converted under Alternatives 2 through 4 and 6.
- Alternative 5 would not require anchored gillnet vessels fishing outside the SAM zone to increase the number of weak links per net panel from one to five or more, depending on net panel size. In addition, Alternative 5 would limit the geographic scope of requirements that anchored gillnet vessels secure their nets at each end with an anchor having the holding power (at minimum) of a 22-pound Danforth-style anchor; this standard would only apply to gear subject to SAM requirements, and on a seasonal basis to gear in the Mid-Atlantic and Southeast when the gear does not return to port with the vessel. Under Alternative 5, the total number of net panels with five or more weak links installed and anchors installed would be approximately two and one percent, respectively, of the total number installed under Alternatives 2 through 4 and 6.

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<sup>56</sup> The analysis evaluates the impact of new ALWTRP requirements relative to the status quo — i.e., a baseline scenario that assumes no change in existing ALWTRP requirements. This baseline scenario is equivalent to Alternative 1 (No Action). As previously stated, it is important to note that the No Action Alternative (Alternative 1) would not achieve the objective of reducing harm to large whales by reducing the likelihood of entanglement and/or reducing the severity of an entanglement should one occur. If Alternative 1 were implemented, there would likely be additional incidents of serious injury and mortality to large whales due to entanglement in commercial fishing gear rather than a reduction in these interactions. Factors such as serious injury and mortality due to commercial fishing impedes the right whale population's ability to recover (Reeves et al., 2001).

Exhibit 5-11

COMPARISON OF IMPACTS BY ALTERNATIVE: QUANTITATIVE RISK REDUCTION INDICATORS<sup>1</sup>

	Regulatory Alternatives					
	No Action 1	2	Preferred 3	4	5	Preferred 6
<b>Changes in the Number of Affected Vessels</b>						
Newly regulated lobster trap/pot vessels	0	11	11	11	11	11
Newly regulated gillnet vessels <sup>2</sup>	0	616	604	615	604	604
Newly regulated other trap/pot vessels	0	415	413	415	413	413
<b>Major Gear Requirements</b>						
Fathoms of groundline converted (millions) <sup>3</sup>	0	43.1	43.0	43.1	0.2	43.0
Fathoms of buoy line with weak links installed on all flotation and/or weighted devices (millions)	0	30.6	30.6	30.6	30.6	30.6
Number of weak links installed on all flotation and/or weighted devices off the main buoy line (thousands)	0	347.2	346.4	347.1	345.9	345.9
Number of gillnet net panels with 5 weak links installed (thousands)*	0	125.7	124.8	125.7	2.1	124.8
Number of gillnet net panels with 1 weak link installed (thousands)	0	60.7	59.7	60.7	118.6	59.7
Number of gillnet strings with anchors installed (thousands)	0	2.9	2.9	2.9	<0.1	2.9
Number of new gear marks (millions)	0	1.8	1.8	1.8	1.8	1.8
<b>Set and Stow Restrictions</b>						
Newly affected vessels - night set restrictions <sup>2</sup>	0	56	44	45	44	44
Newly affected vessels - gear stowing restrictions <sup>2</sup>	0	614	604	614	604	604
Newly affected vessels - one buoy line per trawl of four traps or fewer <sup>4</sup>	0	19	19	19	19	19
<b>Critical Habitat Area Restrictions<sup>5</sup></b>						
Newly regulated vessels in Great South Channel (April 1 – June 30)	0	<1	<1	<1	<1	<1
Newly regulated vessels in Cape Cod Bay (January 1 – May 15)	0	2	2	2	2	2
Fathoms of buoy line converted in Cape Cod Bay (January 1 – May 15)	0	41	41	41	41	41
<b>SAM Program<sup>6</sup></b>						
Newly regulated vessels in SAM program <sup>6,7</sup>	0	<1	<1	<1	25	25
Fathoms of buoy line converted <sup>6,8</sup>	0	908	908	908	8,463	8,463
Number of buoy lines eliminated <sup>6</sup>	0	6	6	6	NA	NA
<b>DAM Program<sup>9</sup></b>						
Newly regulated vessels in DAM program	0	265	264	265	NA	NA
Fathoms of buoy line converted	0	369,732	368,810	369,732	NA	NA
<b>Seasonality</b>						
Number of Trips Subject to Low-Risk Gear Requirements	0	51,702	48,349	51,305	48,349	48,349
Area-Days: Trap/pot (millions) <sup>10</sup>	0	91.9	47.8	78.7	47.8	47.8
Area-Days: Gillnet (millions) <sup>10</sup>	0	92.8	48.1	79.0	48.1	48.1

Key:  
NA = not applicable

## Notes:

<sup>1</sup> Numbers presented in this table represent changes incremental to the baseline. Since Alternative 1 is equivalent to no action, all values equal zero.

<sup>2</sup> Estimates of newly regulated vessels assume that 50 percent of Mid-Atlantic driftnet vessels are currently regulated by ALWTRP requirements that apply in the Mid-Atlantic from December 1 through March 31. All others (i.e., those active only between April 1 and November 30) would be newly regulated.

<sup>3</sup> Under Alternatives 2 through 6, this number includes groundline that would be converted as a result of SAM, DAM, and Critical Habitat Area Restrictions, as well as groundline that would be converted as a result of broad-based gear modification requirements.

<sup>4</sup> This restriction is a new requirement for other trap/pot vessels fishing in Northern Nearshore waters and Stellwagen Bank/Jeffrey's Ledge.

<sup>5</sup> The use of driftnets or anchored float gillnets would be prohibited in the Cape Cod Bay Restricted Area from January 1 through May 15, and in the Great South Channel Restricted Gillnet Area from April 1 through June 30. The use of mixed species trap/pot gear would be prohibited in the Great South Channel Restricted Area from April 1 through June 30.

<sup>6</sup> Under Alternatives 2 through 4 and 6, the SAM program and all gear requirements unique to this program would be eliminated in 2008.

<sup>7</sup> Under Alternatives 2 through 4, this figure represents the number of other trap/pot vessels that would be newly subject to SAM requirements. Under Alternatives 5 and 6, this figure also includes the change in the number of vessels subject to SAM requirements as a result of changes in the SAM zone's boundaries.

<sup>8</sup> Until 2008, Alternatives 2 through 4 would require that buoy lines be made entirely of non-floating line. Under Alternatives 5 and 6, vessels would be allowed to use floating line in the bottom third of the buoy line. Under Alternatives 5 and 6, this figure represents the net change in the fathoms of buoy line converted, including both increases and decreases in buoy line converted as a result of changes in the SAM zone's boundaries.

<sup>9</sup> Under Alternatives 2 through 4, the DAM program and all gear requirements unique to this program would be eliminated in 2008. Under Alternatives 5 and 6, the program would be eliminated six months after promulgation of the rule.

<sup>10</sup> This indicator is calculated by multiplying the square nautical miles of protected area by the number of days that seasonal gear modification requirements apply.

\* In this DEIS, based on the best available information, it was assumed that anchored gillnet vessels in the Northeast and Mid-Atlantic fish net panels that average 50 fathoms (300 feet) in length. Thus, for these areas, gillnet vessels were analyzed as utilizing five weak links per net panel.

As a result of these differences, the benefits of Alternative 5 for whale survival are likely to be significantly lower than the benefits associated with Alternatives 2, 3 (Preferred), 4, and 6 (Preferred).

The impacts of Alternatives 2, 3 (Preferred), 4, and 6 (Preferred) are quite similar, reflecting similarities in the regulatory requirements imposed under each alternative. For example, each of these alternatives would include the conversion of approximately 43 million fathoms of floating groundline to sinking and/or neutrally buoyant line. Further, each would involve the installation of weak links on approximately 30.6 million fathoms of buoy line, the incorporation of a single weak link into more than 59 thousand gillnet panels, and the incorporation of multiple weak links into more than 124 thousand gillnet panels.<sup>57</sup> Similarly, approximately 2,900 gillnet strings would become subject to new minimum anchoring strength standards. Finally, each of these alternatives would extend ALWTRP regulations to more than a thousand additional vessels, including more than 600 newly regulated gillnet vessels and 400 newly regulated other trap/pot vessels. Each newly regulated vessel would correspond to the conversion of floating groundline, installation of additional weak links, and implementation of minimum anchoring strength standards. Such actions are expected to correlate with a greater reduction of entanglement risk to Atlantic large whales.

Variation in the estimated impacts of Alternatives 2, 3 (Preferred), 4, and 6 (Preferred) is generally due to small differences in the number of vessels that would be subject to ALWTRP requirements.<sup>58</sup> These small differences arise from seasonal variation in the application of ALWTRP requirements. As previously noted, the provisions of Alternative 2 would be effective year-round. In contrast, ALWTRP provisions under Alternatives 3 (Preferred) and 6 (Preferred) would be in effect seasonally for vessels fishing in the Mid-Atlantic and Southeast; under Alternative 4, ALWTRP provisions would also be in effect seasonally, but only in the Southeast. The implications of these seasonal differences are reflected by two indicators:

- 1) *Number of trips subject to low-risk gear requirements* – As the indicators presented in Exhibit 5-11 show, the year-round application of regulations envisioned under Alternative 2 would increase the number of commercial fishing trips each year that would be subject to ALWTRP requirements, thus increasing the number of vessels fishing with gear considered to pose a lower risk of entanglement to large whales. Relative to Alternatives 3 (Preferred) and 6 (Preferred), Alternative 2 would affect approximately 3,400 additional vessel trips, a difference of seven percent. Relative to the same two alternatives, Alternative 4 would affect approximately 3,000 additional trips, a difference of six percent.

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<sup>57</sup> In this DEIS, based on the best available information, it was assumed that anchored gillnet vessels in the Northeast and Mid-Atlantic fish net panels that average 50 fathoms (300 feet) in length. Thus, for these areas, gillnet vessels were analyzed as utilizing five weak links per net panel.

<sup>58</sup> For more information on the methodology used to estimate the number of vessels that would be subject to ALWTRP requirements under each regulatory alternative, see Chapter 6.



- 2) *Area-days subject to low-risk gear requirements* – To further reflect the seasonal variation in approach, the exhibit compares the alternatives on the basis of the "area-days" for which broad-based gear modification requirements would be in effect. This indicator is calculated for each alternative by multiplying the square nautical miles of protected area under the plan by the number of days each year that seasonal gear modification requirements would apply. By this measure, Alternative 2 would provide the highest degree of protection (approximately 93 million area-days subject to broad-based gear modification requirements), followed by Alternative 4 (79 million area-days) and Alternatives 3 (Preferred), 5, and 6 (Preferred) with 48 million area-days each.

The spatial and temporal differences in the gear modification requirements suggest that Alternative 2 would provide the highest level of entanglement risk reduction, followed by Alternative 4, then Alternatives 3 (Preferred) and 6 (Preferred). The actual risk-reduction potential of these alternatives, however, is unlikely to vary as much as these indicators imply. The seasonal exemptions provided under Alternatives 3 (Preferred), 4, and 6 (Preferred) are premised on the migratory patterns of whales. Current understanding of these patterns suggests that the risk of entanglement for a whale in the Mid-Atlantic or Southeast during the summer months (June through August) is low. As a result, year-round requirements would likely offer little additional risk reduction relative to seasonal standards.

### **Gear Loss Impacts**

As previously noted, three major gear modification requirements have the potential to affect the amount of gear that commercial fishermen lose, and thus influence the risks of entanglement in ghost gear: groundline requirements, buoy line requirements, and weak link and anchoring requirements. Exhibit 5-12 summarizes, by alternative, the potential impact of these provisions on gear loss rates.<sup>59</sup> Note that weak link and anchoring requirements are not believed to affect gear loss rates.

Out of the alternatives, Alternative 5 has the least potential for increasing gear loss rates. This result is a product of two factors: (1) relatively limited expansion of requirements mandating the use of non-floating groundline; and (2) rapid elimination of the SAM program's non-floating buoy line and single buoy line requirements, both of which may contribute to elevated gear loss rates within the SAM zone.<sup>60</sup> Alternatives 2, 3 (Preferred), 4, and 6 (Preferred) are unlikely to differ with respect to their long-term impacts on gear loss. Until 2008, however, Alternatives 2 through 4 would preserve the SAM program's non-floating buoy line

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<sup>59</sup> It is important to note that this exhibit only provides information on the direction of the change in gear loss rates, and gives no indication of the magnitude of that change.

<sup>60</sup> Alternative 5 would require the use of sinking and/or neutrally buoyant groundline in the newly expanded SAM zone, but would not extend this requirement to additional areas. In addition, Alternative 5 would eliminate the SAM program's non-floating buoy line and single buoy line provisions six months after promulgation of revised ALWTRP regulations.

and single buoy line provisions. This is likely to result in slightly greater near-term gear loss rates under these alternatives than under Alternative 6 (Preferred), which would eliminate the non-floating buoy line and single buoy line provisions six months after promulgation of revised ALWTRP regulations.

Exhibit 5-12						
POTENTIAL CHANGES IN GEAR LOSS RATES <sup>1</sup>						
Regulatory Provision	Regulatory Alternatives					
	No Action 1	2	Preferred 3	4	5	Preferred 6
Non-floating groundline	o	+	+	+	+	+
SAM buoy line requirements						
Non-floating buoy line <sup>2</sup>	o	+	+	+	NA	NA
Single buoy line <sup>2</sup>	o	+	+	+	NA	NA
Floating line in the bottom third of the buoy line <sup>3</sup>	o	-	-	-	-	-
Allowing two buoy lines <sup>3</sup>	o	-	-	-	-	-
Weak links and anchoring	o	o	o	o	o	o
Key: o = no change + = provision has the potential to increase gear loss rates - = provision has the potential to reduce gear loss rates  Notes: <sup>1</sup> This exhibit indicates the likely direction of a potential change in gear loss. It does not provide information about the potential magnitude of the change. <sup>2</sup> Alternatives 2 through 4 would preserve this element of the SAM program and expand its application to other trap/pot vessels until 2008, when the SAM program would be eliminated. <sup>3</sup> Alternatives 2 through 4 would introduce this provision in 2008, when the SAM program would be eliminated.						

## 5.2 OTHER IMPACTS

In addition to impacts on large whale species, changes to ALWTRP regulations may affect other aspects of the marine environment, including other protected species, essential fish habitat, and directed catch and bycatch in affected fisheries. The remainder of this chapter discusses these potential effects, which are summarized in Exhibit 5-13. As the exhibit indicates, there is no significant difference among Alternatives 2 through 6 with respect to impacts on essential fish habitat, directed catch, or bycatch; in each case, the impacts are expected to be minor. The alternatives differ, however, with respect to the ancillary benefits they would afford other protected species. As the following discussion explains, these differences stem from differences in the extent to which the alternatives would mandate broad-based gear modifications requirements that could prove beneficial to potentially affected species of whales, porpoises, dolphins, seals, and sea turtles.

Exhibit 5-13

**IMPACTS OF REGULATORY ALTERNATIVES ON OTHER PROTECTED SPECIES,  
ESSENTIAL FISH HABITAT, DIRECTED CATCH, AND BYCATCH**

<b>Regulatory Alternative</b>	<b>Impacts on Other Protected Species</b>	<b>Impacts on Essential Fish Habitat</b>	<b>Impacts on Directed Catch and Bycatch</b>
Alternative 1 (No Action)	<ul style="list-style-type: none"> <li>• Status quo - no additional impact</li> </ul>	<ul style="list-style-type: none"> <li>• Status quo - no additional impact</li> </ul>	<ul style="list-style-type: none"> <li>• Status quo - no additional impact</li> </ul>
Alternative 2	<ul style="list-style-type: none"> <li>• Groundline and buoy line requirements could help directly reduce entanglement risks for sea turtles, whales, dolphins, porpoises, and seals; gear marking requirements could provide an indirect benefit. Weak link and net anchoring requirements may benefit blue, sei, and sperm whales, since these species would possess the size and strength for weak links to function properly. Benefits of broad-based gear modification requirements would be realized in all regulated areas year-round.</li> <li>• Seasonal closure of Great South Channel and Cape Cod Bay Restricted Areas to additional fisheries could provide limited ancillary benefits to sea turtles, sei whales, harbor porpoises, seals, and some pelagic delphinids that may be present during the times that the closures are in effect.</li> <li>• Expansion of gillnet areas subject to ALWTRP requirements in the Mid-Atlantic and Southeast could provide ancillary benefits to other protected species in the event of increased gillnet activity in these areas.</li> <li>• Expansion of exempted waters could increase entanglement risks in these areas for some other protected species, such as sea turtles.</li> <li>• Extension of SAM and DAM programs to additional fisheries until 2008 could provide ancillary benefits to other protected species that may be present in these areas during the times that they are in effect.</li> </ul>	<ul style="list-style-type: none"> <li>• Potential increase in fishing pressure in exempted areas could have an adverse impact on the benthic environment.</li> <li>• Gillnet anchors and sinking and/or neutrally buoyant groundline could have an adverse impact on benthic habitat, but such impacts are likely to be minimal and temporary; a possible exception could occur in the Southeast, where impacts on coral and other benthic organisms are of particular concern.</li> <li>• Changes in gear loss rates associated with gear modification requirements could have an indirect effect on the benthic environment.</li> </ul>	<ul style="list-style-type: none"> <li>• Gear modification requirements are expected to have no direct impact on directed catch or bycatch; changes in gear loss rates associated with these requirements could have an indirect effect.</li> <li>• Seasonal closure of Cape Cod Bay and Great South Channel Restricted Areas to additional fisheries should have minimal impact.</li> <li>• Potential increase in fishing pressure in exempted areas could reduce directed catch in those areas.</li> </ul>

## Exhibit 5-13

**IMPACTS OF REGULATORY ALTERNATIVES ON OTHER PROTECTED SPECIES,  
ESSENTIAL FISH HABITAT, DIRECTED CATCH, AND BYCATCH**

<b>Regulatory Alternative</b>	<b>Impacts on Other Protected Species</b>	<b>Impacts on Essential Fish Habitat</b>	<b>Impacts on Directed Catch and Bycatch</b>
Alternative 3 (Preferred)	<ul style="list-style-type: none"> <li>• Groundline and buoy line requirements could help directly reduce entanglement risks for sea turtles, whales, dolphins, porpoises, and seals; gear marking requirements could provide an indirect benefit. Weak link and net anchoring requirements may benefit blue, sei, and sperm whales, since these species would possess the size and strength for weak links to function properly. Benefits of broad-based gear modification requirements would be realized year-round in the Northeast, but only seasonally in the Mid-Atlantic and Southeast.</li> <li>• Seasonal closure of Great South Channel and Cape Cod Bay Restricted Areas to additional fisheries could provide limited ancillary benefits to sea turtles, sei whales, harbor porpoises, seals, and some pelagic delphinids that may be present during the times that the closures are in effect.</li> <li>• Expansion of gillnet areas subject to ALWTRP requirements in the Mid-Atlantic and Southeast could provide ancillary benefits to other protected species in the event of increased gillnet activity in these areas.</li> <li>• Expansion of exempted waters could increase entanglement risks in these areas for some other protected species, such as sea turtles.</li> <li>• Extension of SAM and DAM programs to additional fisheries until 2008 could provide ancillary benefits to other protected species that may be present in these areas during the times that they are in effect.</li> </ul>	<ul style="list-style-type: none"> <li>• Potential increase in fishing pressure in exempted areas could have an adverse impact on the benthic environment.</li> <li>• Gillnet anchors and sinking and/or neutrally buoyant groundline could have an adverse impact on benthic habitat, but such impacts are likely to be minimal and temporary; a possible exception could occur in the Southeast, where impacts on coral and other benthic organisms are of particular concern.</li> <li>• Changes in gear loss rates associated with gear modification requirements could have an indirect effect on the benthic environment.</li> </ul>	<ul style="list-style-type: none"> <li>• Gear modification requirements are expected to have no direct impact on directed catch or bycatch; changes in gear loss rates associated with these requirements could have an indirect effect.</li> <li>• Seasonal closure of Cape Cod Bay and Great South Channel Restricted Areas to additional fisheries should have minimal impact.</li> <li>• Potential increase in fishing pressure in exempted areas could reduce directed catch in those areas.</li> </ul>

Exhibit 5-13

**IMPACTS OF REGULATORY ALTERNATIVES ON OTHER PROTECTED SPECIES,  
ESSENTIAL FISH HABITAT, DIRECTED CATCH, AND BYCATCH**

<b>Regulatory Alternative</b>	<b>Impacts on Other Protected Species</b>	<b>Impacts on Essential Fish Habitat</b>	<b>Impacts on Directed Catch and Bycatch</b>
Alternative 4	<ul style="list-style-type: none"> <li>• Groundline and buoy line requirements could help directly reduce entanglement risks for sea turtles, whales, dolphins, porpoises, and seals; gear marking requirements could provide an indirect benefit. Weak link and net anchoring requirements may benefit blue, sei, and sperm whales, since these species would possess the size and strength for weak links to function properly. Benefits of broad-based gear modification requirements would be realized year-round in the Northeast and Mid-Atlantic, but only seasonally in the Southeast.</li> <li>• Seasonal closure of Great South Channel and Cape Cod Bay Restricted Areas to additional fisheries could provide limited ancillary benefits to sea turtles, sei whales, harbor porpoises, seals, and some pelagic delphinids that may be present during the times that the closures are in effect.</li> <li>• Expansion of gillnet areas subject to ALWTRP requirements in the Mid-Atlantic and Southeast could provide ancillary benefits to other protected species in the event of increased gillnet activity in these areas.</li> <li>• Expansion of exempted waters could increase entanglement risks in these areas for some other protected species, such as sea turtles.</li> <li>• Extension of SAM and DAM programs to additional fisheries until 2008 could provide ancillary benefits to other protected species to other protected species that may be present in these areas during the times that they are in effect.</li> </ul>	<ul style="list-style-type: none"> <li>• Potential increase in fishing pressure in exempted areas could have an adverse impact on the benthic environment.</li> <li>• Gillnet anchors and sinking and/or neutrally buoyant groundline could have an adverse impact on benthic habitat, but such impacts are likely to be minimal and temporary; a possible exception could occur in the Southeast, where impacts on coral and other benthic organisms are of particular concern.</li> <li>• Changes in gear loss rates associated with gear modification requirements could have an indirect effect on the benthic environment.</li> </ul>	<ul style="list-style-type: none"> <li>• Gear modification requirements are expected to have no direct impact on directed catch or bycatch; changes in gear loss rates associated with these requirements could have an indirect effect.</li> <li>• Seasonal closure of Cape Cod Bay and Great South Channel Restricted Areas to additional fisheries should have minimal impact.</li> <li>• Potential increase in fishing pressure in exempted areas could reduce directed catch in those areas.</li> </ul>

## Exhibit 5-13

**IMPACTS OF REGULATORY ALTERNATIVES ON OTHER PROTECTED SPECIES,  
ESSENTIAL FISH HABITAT, DIRECTED CATCH, AND BYCATCH**

<b>Regulatory Alternative</b>	<b>Impacts on Other Protected Species</b>	<b>Impacts on Essential Fish Habitat</b>	<b>Impacts on Directed Catch and Bycatch</b>
Alternative 5	<ul style="list-style-type: none"> <li>• Extension of SAM groundline and buoy line requirements to additional fisheries and expansion of the SAM program to new areas could help directly reduce entanglement risks for sea turtles, whales, dolphins, porpoises, and seals that may be present in the SAM areas during the times that SAM is in effect; gear marking requirements could provide an indirect benefit. Benefits of broad-based gear modification requirements would not be realized.</li> <li>• Seasonal closure of Great South Channel and Cape Cod Bay Restricted Areas to additional fisheries could provide limited ancillary benefits to sea turtles, sei whales, harbor porpoises, seals, and some pelagic delphinids that may be present during the times that the closures are in effect.</li> <li>• Expansion of gillnet areas subject to ALWTRP requirements in the Mid-Atlantic and Southeast could provide ancillary benefits to other protected species in the event of increased gillnet activity in these areas.</li> <li>• Expansion of exempted waters could increase entanglement risks in these areas for some other protected species, such as sea turtles.</li> </ul>	<ul style="list-style-type: none"> <li>• Potential increase in fishing pressure in exempted areas could have an adverse impact on the benthic environment.</li> <li>• Gillnet anchors and sinking and/or neutrally buoyant groundline could have an adverse impact on benthic habitat, but such impacts are likely to be minimal and temporary.</li> <li>• Changes in gear loss rates associated with gear modification requirements could have an indirect effect on the benthic environment.</li> </ul>	<ul style="list-style-type: none"> <li>• Gear modification requirements are expected to have no direct impact on directed catch or bycatch; changes in gear loss rates associated with these requirements could have an indirect effect.</li> <li>• Seasonal closure of Cape Cod Bay and Great South Channel Restricted Areas to additional fisheries should have minimal impact.</li> <li>• Potential increase in fishing pressure in exempted areas could reduce directed catch in those areas.</li> </ul>

## Exhibit 5-13

**IMPACTS OF REGULATORY ALTERNATIVES ON OTHER PROTECTED SPECIES,  
ESSENTIAL FISH HABITAT, DIRECTED CATCH, AND BYCATCH**

<b>Regulatory Alternative</b>	<b>Impacts on Other Protected Species</b>	<b>Impacts on Essential Fish Habitat</b>	<b>Impacts on Directed Catch and Bycatch</b>
Alternative 6 (Preferred)	<ul style="list-style-type: none"> <li>• Groundline and buoy line requirements could help directly reduce entanglement risks for sea turtles, whales, dolphins, porpoises, and seals; gear marking requirements could provide an indirect benefit. Benefits of broad-based gear modification requirements would be realized year-round in the Northeast but only seasonally in the Mid-Atlantic and Southeast.</li> <li>• Seasonal closure of Great South Channel and Cape Cod Bay Restricted Areas to additional fisheries could provide limited ancillary benefits to sea turtles, sei whales, harbor porpoises, seals, and some pelagic delphinids that may be present during the times that the closures are in effect.</li> <li>• Expansion of gillnet areas subject to ALWTRP requirements in the Mid-Atlantic and Southeast could provide ancillary benefits to other protected species in the event of increased gillnet activity in these areas.</li> <li>• Expansion of exempted waters could increase entanglement risks in these areas for some other protected species, such as sea turtles.</li> <li>• Expansion of SAM area and extension of SAM program to additional fisheries until 2008 could provide ancillary benefits to other protected species that may be present in the SAM areas during the times that SAM is in effect.</li> </ul>	<ul style="list-style-type: none"> <li>• Potential increase in fishing pressure in exempted areas could have an adverse impact on the benthic environment.</li> <li>• Gillnet anchors and sinking and/or neutrally buoyant groundline could have an adverse impact on benthic habitat, but such impacts are likely to be minimal and temporary; a possible exception could occur in the Southeast, where impacts on coral and other benthic organisms are of particular concern.</li> <li>• Changes in gear loss rates associated with gear modification requirements could have an indirect effect on the benthic environment.</li> </ul>	<ul style="list-style-type: none"> <li>• Gear modification requirements are expected to have no direct impact on directed catch or bycatch; changes in gear loss rates associated with these requirements could have an indirect effect.</li> <li>• Seasonal closure of Cape Cod Bay and Great South Channel Restricted Areas to additional fisheries should have minimal impact.</li> <li>• Potential increase in fishing pressure in exempted areas could reduce directed catch in those areas.</li> </ul>





### 5.2.1 Impacts to Other Protected Species

In addition to the large whales discussed in Section 5.1, other protected species in the waters subject to regulation under the ALWTRP can become entangled in commercial fishing gear. Some other protected species, such as the shortnose sturgeon, the Gulf of Maine distinct population segment of Atlantic salmon, roseate terns, and piping plovers, which are listed under the Endangered Species Act, also utilize waters potentially subject to ALWTRP requirements. These species, however, are minimally affected by the commercial fishing operations that are regulated under the ALWTRP. Hence, the biological impacts analysis does not address these species.

This section assesses the potential impact of modifications to the ALWTRP on other ESA listed species and marine mammals, and non-ESA listed marine mammals. The ESA listed species include Kemp's ridley, loggerhead, leatherback, green, and hawksbill sea turtles, as well as sperm, blue, and sei whales. Leatherback, Kemp's ridley, green (Florida and Pacific coast of Mexico breeding populations), and hawksbill turtles are listed as endangered under the Endangered Species Act, while loggerhead turtles are listed as threatened. Non-ESA listed marine mammals include harbor porpoises, coastal bottlenose dolphins, Atlantic white-sided dolphins, Risso's dolphins, pelagic delphinids (spotted dolphins, striped dolphins, pilot whales, offshore bottlenose dolphins, and common dolphins), harbor, gray, and harp seals. Bottlenose dolphins (coastal stock), pilot whales, and common dolphins are considered neither endangered nor threatened, but are afforded protection as strategic stocks under the Marine Mammal Protection Act.

NMFS believes that some of the other protected species whose ranges overlap with the fisheries managed by the ALWTRP may be potentially affected by the proposed changes outlined in this DEIS. For harbor porpoises, Atlantic white-sided, spotted, striped, offshore bottlenose, and Risso's dolphins, and harbor, gray, and harp seals, the total fishery-related mortality and serious injury for potentially affected stocks is considered to be insignificant and approaching a zero mortality and serious injury rate.<sup>61</sup> However, as a precautionary approach, NMFS considers these species potentially affected due to the possible overlap between the fisheries regulated under the ALWTRP and the range of these species.

The Nova Scotian stock of sei whales occurs only in the Northeast and Mid-Atlantic (Waring et al. 2003); therefore, the potential ALWTRP effects related to these species are only discussed for these areas. Hawksbill sea turtles have a southerly distribution; therefore, the potential ALWTRP effects related to this species are only discussed for measures pertaining to the Southeast.

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<sup>61</sup> According to the most recent U.S. Atlantic and Gulf of Mexico Marine Mammal Stock Assessment Report for the Western North Atlantic (WNA) stock of each species, which are as follows: striped and Atlantic spotted dolphins (Waring et al., 2000); pantropical spotted and Risso's dolphins (Waring et al., 2002); Atlantic white-sided and offshore bottlenose dolphins, harbor, gray, and harp seals, and harbor porpoise (Gulf of Maine/Bay of Fundy stock) (Waring et al., 2003).

### 5.2.1.1 Groundline Requirements

As previously described, Alternatives 2 through 6 would require the use of sinking and/or neutrally buoyant (i.e., non-floating) groundline in designated areas at certain times. In each case, this requirement is not likely to adversely impact other protected species. In contrast, alternatives requiring non-floating groundline may decrease the risk of entanglement, and thus serious injury or mortality, for these species.

Though relatively little information exists about groundline entanglements of sea turtles, it is believed that measures that reduce the amount of groundline floating or forming loops in the water column may decrease the risk of entanglement for most species. Furthermore, in the case of leatherback sea turtles, to the extent that requiring non-floating groundline might reduce the risk of entanglement, this could also have a beneficial effect on mortality rates related to ship strikes, as research suggests that entangled leatherbacks are more susceptible to such incidents (NMFS, 2001a).

Although the commercial fisheries regulated under the ALWTRP may affect blue and sperm whales, there seems to be significant separation between the known feeding range of these species and primary fishing areas. In addition, Waring et al. (2002) indicate that the level of fishery interaction for these species is insignificant and approaching a zero mortality and serious injury rate. Therefore, the gear used in the commercial fisheries regulated under the ALWTRP is not likely to adversely affect blue or sperm whales.

Due to similarities in distribution, feeding behavior, and other characteristics, sei whales are believed to benefit from ALWTRP measures in much the same manner as the other large whale species the plan is designed to protect.

Bottlenose dolphins, harbor porpoises, Atlantic white-sided dolphins, pelagic delphinids (pilot whales, and spotted, striped, and common dolphins), harbor, gray, and harp seals more commonly become ensnared in nets rather than lines; however, marine mammals could become entangled in groundline, and any reduction in the amount of line in the water column should decrease the risk of entanglement for these species. Modifications that reduce the risk of entanglement would have a favorable effect on serious injury and mortality rates, and thus increase recruitment.<sup>62</sup>

In summary, Alternatives 2-4 and 6 would require that approximately 43,000,000 fathoms of groundline be converted to sinking and/or neutrally buoyant line compared to the No Action Alternative (Alternative 1). Since Alternative 5 would apply to fishing gear only in areas within the expanded SAM area and does not include broad-based gear modifications, only approximately 200,000 fathoms of groundline would be converted under this alternative (see Exhibit 5-11 in section 5.1.3.2). Thus, though it is important to recognize the lack of information about entanglements in groundline for some of the species (such as sea turtles), compared to Alternatives 2 through 4 and 6, reduction of entanglement risks from floating groundline to other protected species may be less under Alternative 5.

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<sup>62</sup> Recruitment refers to the process of adding juveniles or sub-adults to a population.

### 5.2.1.2 Buoy Line Requirements

In addition to the large whales discussed in Section 5.1, other protected species in the waters subject to regulation under the ALWTRP are known to become entangled in lobster, other trap/pot, and gillnet buoy lines (NMFS, 2001a; NMFS, 2001b; NMFS, 2001c; NMFS, 2001d).<sup>63</sup> In particular, NMFS receives several reports of leatherback entanglements in lobster trap/pot buoy lines every year (Dwyer et. al., 2002). Data collected by the Sea Turtle Stranding and Salvage Network (STSSN) and NMFS also support that whelk trap/pot gear was involved in a number of reported leatherback entanglements in Massachusetts and New Jersey Waters (NMFS unpublished data, 2001). Research suggests that leatherbacks may be attracted to buoys because they resemble jellyfish, one of the turtles' prey. Leatherbacks and loggerheads may also attempt to feed on the bivalves, algae, and gelatinous organisms that colonize buoys and ropes (NMFS, 2001a). Once a sea turtle becomes entangled, its mobility is impaired and its ability to feed may be hampered. Entangled turtles may eventually drown under the weight of the gear or if the trailing gear becomes lodged on rocks or ledges below the surface.

As described previously, the regulatory changes under consideration include several provisions pertaining to buoy lines which are designed to reduce large whale entanglement risks. For example, Alternatives 2 through 6 would extend the universal gear modification requirement to several new fisheries in ALWTRP-regulated waters, including the Atlantic mixed species trap/pot fishery, the Northeast anchored float gillnet fishery, and the Southeast Atlantic gillnet fishery.<sup>64</sup> This requirement prohibits the use of gillnet or trap/pot gear that at any time has any portion of the buoy line floating at the surface. It also encourages (but does not require) fishermen to keep buoy lines as knot-free as possible. The extension of this standard to additional fisheries could benefit other protected species, such as sea turtles, by reducing the risk of entanglement associated with floating buoy line at the surface. Similarly, the use of knot-free lines could diminish the risk of entanglement by reducing the likelihood that line would become lodged around appendages.

Although the commercial fisheries regulated under the ALWTRP may affect blue and sperm whales, there seems to be significant separation between the known feeding range of these species and primary fishing areas. In addition, Waring et al. (2002) indicate that the level of fishery interaction is insignificant and approaching a zero mortality and serious injury rate. Therefore, the gear used in the commercial fisheries regulated under the ALWTRP is not likely to adversely affect blue or sperm whales.

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<sup>63</sup> With respect to other trap/pot fisheries, NMFS has documented the entanglement of sea turtles in buoy lines associated with whelk, crab, and black sea bass trap/pot gear.

<sup>64</sup> Alternatives 2 and 4 would also require the Mid-Atlantic anchored gillnet fishery to comply with the universal gear modification standard year-round; Alternatives 3 (Preferred), 5, and 6 (Preferred) would require the Mid-Atlantic anchored gillnet fishery to comply with this requirement on a seasonal basis (September 1 through May 31).

Due to similarities in distribution, feeding behavior, and other characteristics, sei whales are believed to benefit from ALWTRP measures in much the same manner as the large whale species the plan is designed to protect.

Bottlenose dolphins, harbor porpoises, Atlantic white-sided dolphins, pelagic delphinids (pilot whales, and spotted, striped, and common dolphins), harbor, gray, and harp seals more commonly become ensnared in nets rather than lines; however, marine mammals could become entangled in buoy line, and any reduction in the amount of line in the water column should decrease the risk of entanglement for these species.

Alternatives 2 through 6 would also mandate that vessels fishing in certain areas at specified times use non-floating buoy line. In some instances (e.g., Alternatives 2 through 4 in waters subject to the SAM program), the regulations would require the use of non-floating material throughout the buoy line's entire length; in others (e.g., Alternatives 5 and 6 in waters subject to the SAM program), they would require its use only along the upper two-thirds of the line. In either case, the requirement is designed to reduce entanglement risks by reducing the amount of floating line in the water column.

Just as these measures could benefit large whales, they could also benefit other protected species by eliminating loops of line at the surface. This measure may reduce the likelihood of some turtle interactions with fishing gear; however, given the limited knowledge of turtle interactions with buoy line, there is no way to quantify the reduction in risk through reducing the amount of floating buoy line in the water column.

As an additional measure of protection, the alternatives analyzed would in several cases impose restrictions designed to reduce the number of buoy lines that fishermen employ. Alternatives 2 through 4 would limit other trap/pot gear in the Cape Cod Bay Restricted Area from January 1 through May 15 to a two-trap string that can have only one buoy line, or to trawls of four or more traps. Alternatives 2 through 4 would also (1) prohibit the use of single traps in Northern Nearshore waters, Stellwagen Bank/Jeffrey's Ledge, and in Federal waters of Cape Cod Bay from May 16 to December 31; (2) prohibit the use of more than one buoy line on trawls of four or fewer traps in Northern Nearshore waters, Stellwagen Bank/Jeffrey's Ledge, and in Federal waters of Cape Cod Bay from May 16 to December 31; and (3) set a limit of one buoy line per trawl in SAM restricted waters until 2008, when SAM provisions would be eliminated. Alternatives 5 and 6 would set similar requirements, except that trawls set in SAM restricted waters would be allowed two buoy lines per trawl. By helping to reduce the amount of buoy line in the water column, these measures would help to reduce the entanglement risks faced by other protected species, as well as whales.<sup>65</sup> In particular, the measures for Cape Cod Bay and the

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<sup>65</sup> As noted previously, some of the changes described above appear to constitute a relaxation of existing standards. For example, current ALWTRP regulations for the Northern Nearshore and Stellwagen Bank/Jeffrey's Ledge lobster trap/pot fishery, and for the Federal waters of Cape Cod Bay (May 16 through December 31) allow only one buoy line on trawls of *five* or fewer traps, rather than four. Similarly, current SAM standards for lobster trap/pot and gillnet gear prohibit the use of more than one buoy line; Alternatives 5 and 6 would eliminate this requirement six months after promulgation of the rule, while Alternatives 2, 3, and 4 would eliminate the requirement in 2008, when the SAM program would expire. In both cases, however, consideration of the change is motivated by concerns that requiring the use of a single buoy line may encourage fishermen to split trawls or strings, thus increasing the number of buoy lines in the water. In addition, requiring the use of a single buoy line may

Northern Nearshore waters (May 16 to December 31) may benefit both hard-shelled and leatherback turtles, as they occur seasonally in these waters.

### 5.2.1.3 Weak Link and Anchoring Requirements

As described previously, Alternatives 2 through 6 include time- and area-specific provisions requiring the incorporation of weak links on flotation and/or weighted devices attached to the buoy line on gillnet, lobster trap/pot, and other trap/pot gear. These alternatives would also require the incorporation of weak links into gillnet panels, and would specify minimum anchoring strength standards for anchored gillnets. These requirements are designed to reduce the likelihood that interactions between whales and commercial fishing gear will result in entanglements that cause serious injury or death.

These provisions are likely to reduce the risk of serious injury or mortality to large whales, therefore, they are likely to have a beneficial effect only for some of the other protected species. The larger of the other protected species, such as blue, sei, and sperm whales, may benefit from the weak link and anchoring requirements in the unlikely event of an entanglement because they would possess the size and strength necessary for the weak links to function properly. However, smaller animals, including bottlenose dolphins, harbor porpoises, Atlantic white-sided dolphins, pelagic delphinids (pilot whales, and spotted, striped, and common dolphins), harbor, gray and harp seals, and sea turtles, may lack the strength to break weak links as strong as those that would be allowed under the ALWTRP.

### 5.2.1.4 Set Restrictions and Gear Stowing Requirements

The potential regulatory changes under analysis include several restrictions on the use of gillnet gear:

- *Northeast and Mid-Atlantic* – Alternatives 2 and 4 would prohibit the use of driftnet gear at night in Northeast and Mid-Atlantic waters unless the gear is tended, and would require that all such gear be removed from the water and stowed on board the vessel before it returns to port. These regulations would be in effect year-round. Alternatives 3 (Preferred), 5, and 6 (Preferred) would institute similar requirements on a year-round basis in waters north and east of a line extending from Watch Hill, Rhode Island (41°18.2'N and 71°51.5'W) south to 40°00'N, then east to the boundary of the EEZ; south and west of this area, the regulations would only be in effect from September 1 through May 31.
- *Southeast Atlantic* – In Southeast waters, Alternatives 2 through 6 would establish seasonal prohibitions on straight sets of gillnet gear at night, and

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increase the risk of gear loss, thus increasing the entanglement risks associated with ghost gear. In light of these factors, NMFS believes that elimination of the current requirement could potentially decrease entanglement risks.

similar prohibitions on the use of strikenets at night or when visibility is less than 500 yards. These restrictions would be in effect from November 15 through April 15 in waters between the South Carolina/Georgia border and 29°00' N; and from December 1 through March 31 in waters between 29°00' N and 27°51' N for Southeast gillnet fisheries, and in waters between 29°00' N and 26°46.5' N for Southeast shark gillnet fisheries. Note that the eastern boundary for these areas is the EEZ.

The provisions noted above could help to reduce entanglement risks for other protected species. For example, the prohibition on the use of strikenets when visibility is less than 500 yards could reduce instances in which poor visibility may contribute to entanglement (of sea turtles or bottlenose dolphins, in particular). These species may also benefit from the prohibition on straight sets of gillnet gear at night, which has the effect of removing gear from the water column during this period.<sup>66</sup> Similarly, the requirement that driftnet vessels in the Northeast and Mid-Atlantic remove their gear from the water and stow it on board before returning to port may help to reduce instances in which failure to tend gear contributes to the entanglement of other protected species.

Under Alternatives 3 through 6, approximately 44 vessels would be affected for night set restrictions, and under Alternative 2 approximately 56 vessels would be affected compared to the No Action Alternative (Alternative 1). The additional 12 vessels under Alternative 2 are likely a result of year-round regulations (see Exhibit 5-11). Furthermore, under Alternatives 3, 5, and 6, approximately 604 vessels would be newly affected by gear stowing restrictions, and under Alternatives 2 and 4 approximately 614 vessels would be newly affected by gear stowing requirements compared to the status quo (Alternative 1, No Action) (see Exhibit 5-11). The additional 10 vessels under Alternatives 2 and 4 are likely a result of year-round regulations in the Mid-Atlantic. As previously stated, the implementation of these requirements would offer ancillary benefits of varying degree to other protected species, depending on their presence in the affected area, and the alternative implemented.

### 5.2.1.5 Gear Marking Requirements

With the exception of Alternative 1 (No Action), all of the regulatory alternatives under consideration would impose new gear marking requirements. According to preliminary estimates, there would be little difference in gear marking requirements among Alternatives 2 through 6 (see Exhibit 5-11). As with whales, these requirements would have no direct impact on the probability of other protected species becoming entangled in commercial fishing gear, nor would they affect the severity of an entanglement should one occur. Nonetheless, the gear marking requirements under consideration would help to generate information on the nature of the gear involved in an entanglement of any protected species. In addition, these provisions

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<sup>66</sup> The ranges of the WNA stocks of blue whales, Atlantic white-sided and Risso's dolphins, pelagic delphinids, harbor, gray, and harp seals, sei whales (Nova Scotian stock), sperm whales (North Atlantic stock), and harbor porpoises (Gulf of Maine/Bay of Fundy stock) are typically well north of the waters subject to these provisions; thus, these requirements would be unlikely to provide benefits for these species (Waring et al., 2000, 2002, and 2003).

would in some cases allow NMFS to identify the owner of the gear, and thus allow the agency to gather additional information on where, when, and how the gear was set. By increasing scientific understanding of the nature of entanglements, the gear marking measures would allow NMFS, over time, to improve the effectiveness of programs designed to reduce the entanglement risks faced by other protected species. Thus, these measures could contribute indirectly to the preservation and restoration of the other potentially-affected protected species.

#### **5.2.1.6 Changes to Mid-Atlantic and Southeast Restricted Areas and Times**

Current ALWTRP regulations specify standards for the use of gillnets within the Mid-Atlantic Coastal Waters Area and the Southeast U.S. Observer and Restricted Areas. Except for Alternative 1 (No Action), each of the regulatory alternatives under analysis would expand the geographic scope of the ALWTRP to include all Mid-Atlantic and Southeast waters within the EEZ north of 26°46.5' N. South of the South Carolina/Georgia border, these alternatives would also extend the limits of the Southeast U.S. Observer and Restricted areas eastward to the boundary of the EEZ, revise the time period during which ALWTRP regulations in these areas would apply, and replace requirements for 100 percent observer coverage within these areas with a requirement to employ an automated Vessel Monitoring System. For shark fisheries, the waters between the South Carolina/Georgia border and 27°51' N would be renamed the “Northern Monitoring and Restricted Area.” Those farther south, to 26°46.5' N, would be renamed the “Southern Monitoring Area.” For other gillnet fisheries, the waters north of 27°51'N, where non-shark gillnetting occurs, would be designated as “Other Southeast Gillnet Waters.” To avoid confusion when comparing current regulatory requirements to those under each alternative, this document retains the original nomenclature.

Gillnet vessels in the Southeast and Mid-Atlantic do not typically fish in the area that would be newly regulated by the ALWTRP, nor are they typically active during periods that would be newly subject to ALWTRP requirements. As a result, the changes described above would be unlikely to have a major or immediate impact on other protected species. NMFS is considering these changes primarily to ensure that ALWTRP requirements would be in place to address any expansion of current activity. Should such expansion occur, the revised standards could provide the following benefits to other protected species:

- **Regulation of commercial fishing activity in additional areas –** Extending the geographic scope of ALWTRP requirements could provide further protection to sea turtles inhabiting waters east of South Carolina, Georgia, and Florida, particularly endangered leatherback turtles that begin to nest in February along the coast of Florida (NMFS, 2001e). In addition, extending requirements to additional areas in the Mid-Atlantic may further benefit leatherbacks because they live in deeper waters than other turtle species and may feed in the water column at night. Therefore, requiring restrictions on the presence of and modifications to sets of gillnets at night may reduce interactions between leatherbacks and gillnets. Bottlenose dolphins also inhabit these waters, and could benefit from expansion of the areas covered by the plan.

- **Increased spotter plane coverage** – Expansion of the Southeast U.S. Restricted Area eastward to the boundary of the EEZ would increase the size of the region within which vessels strikenetting for sharks must obtain spotter plane coverage. Although aerial surveillance is less effective in detecting smaller animals than it is in detecting large whales, it is possible that increased spotter plane coverage would provide some ancillary benefit in protecting sea turtles or bottlenose dolphins.<sup>67</sup> The expanded use of spotter planes could also provide an indirect benefit to these species by providing additional data on their distribution and abundance.
- **Incidental benefits associated with whale approach requirements** – Implementing current whale approach requirements on a year-round basis within the newly expanded Southeast U.S. Observer and Restricted Areas (Alternative 2), or modifying the time during which these requirements are in effect to better correspond to periods when endangered whales are likely to be present (Alternatives 3 through 6), is likely to have minimal impact on other protected species. Any benefits are likely to be a result of the incidental presence of other protected species in the vicinity of whales. Bottlenose dolphins, for example, are sometimes observed in the vicinity of whales; thus, the whale approach requirements may afford some ancillary benefit to this species.

Amendment 1 to the Highly Migratory Species Fishery Management Plan (68 FR 74746, 69 FR 19979, and 69 FR 28106) will require shark gillnet vessels operating in the Southeast U.S. Restricted and Southeast U.S. Observer Areas to employ automated vessel monitoring systems (VMSs). Alternatives 2 through 6 will allow the use of VMS in lieu of 100% observer coverage to monitor the time/area closure in the Restricted Area. This change is unlikely to have an adverse effect on other protected species. Although 100 percent observer coverage would no longer be mandatory, sufficient coverage would be maintained to provide statistically significant data on the fishery's take of protected species. In addition, replacement of the current observer program with a VMS requirement will free up resources that will allow NMFS to extend the observer program to other high priority fisheries for which coverage has been lacking.

#### **5.2.1.7 Expanded SAM Under Alternatives 5 and 6**

As described previously, the SAM program was established to protect predictable seasonal aggregations of North Atlantic right whales in the waters off Cape Cod and eastward to the boundary of the EEZ. As defined under current regulations, the program includes two areas, SAM West and SAM East, and specifies time periods for each (March 1 through April 30 and

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<sup>67</sup> The ranges of the NWA stocks of blue whales, Atlantic white-sided dolphins, pelagic delphinids, harbor, gray, and harp seals, sei whales (Nova Scotian stock), sperm whales (North Atlantic stock), and harbor porpoises (Gulf of Maine/Bay of Fundy stock) are typically well north of the of the Southeast U.S. Observer and Restricted Areas; thus, these requirements would be unlikely to provide benefits for these species (Waring et al., 2000, 2002, and 2003).



May 1 through July 31, respectively) during which gear modification standards for lobster trap/pot and anchored gillnet gear are more stringent than is otherwise required.

Both Alternative 5 and Alternative 6 (Preferred) propose to change the boundaries of the SAM areas. The change in boundaries would be based upon recent analyses of right whale sightings data held by URI, and would result in a net expansion of the area subject to SAM requirements. The new boundaries would become effective within six months of promulgation of new ALWTRP requirements. Under Alternative 6 (Preferred), however, SAM requirements would remain in effect only until 2008. The program would be eliminated in that year, when the broad-based gear modification requirements mandated under Alternative 6 (Preferred) would come into effect. Expansion of the SAM zone under these two alternatives is expected to regulate an additional 25 vessels in this area when compared to Alternatives 1 through 4 (see Exhibit 5-11).

Although the SAM program is designed to protect large whales, it establishes a number of gear modification requirements that are potentially beneficial to other protected species that may be present in the SAM areas during the times that SAM is in effect. For example, under Alternatives 5 and 6 (Preferred), the SAM program would mandate the use of sinking and/or neutrally buoyant line on the upper two-thirds of all buoy lines, and would require the use of sinking and/or neutrally buoyant groundline. Expansion of the SAM zone would extend these requirements to additional areas that may be inhabited by other protected species at the time the gear modification requirements would be in effect. For example, due to similarities in distribution, feeding behavior, and other characteristics, sei whales are believed to benefit from ALWTRP measures in much the same manner as the species the plan is designed to protect. It is also possible that the benefits of expanding the SAM areas may be even greater if fishermen choose to fish SAM-modified gear outside of the required times and areas.

Although there seems to be significant separation between the known feeding range of blue and sperm whales and the primary fishing areas covered by the ALWTRP, expansion of the SAM zone could benefit these species if they incidentally occur in this area when the gear modifications are in effect.

Bottlenose dolphins, harbor porpoises, Atlantic white-sided dolphins, pelagic delphinids (pilot whales, and spotted, striped, and common dolphins), harbor, gray, and harp seals more commonly become ensnared in nets rather than lines; however, marine mammals could become entangled in groundline or buoy line, and any modification that reduces line floating in the water column may decrease the risk of entanglement for these species.

#### **5.2.1.8 New Fishery Closures in Restricted Areas**

With the exception of Alternative 1 (No Action), each of the regulatory alternatives under consideration would expand the scope of the ALWTRP to include the Atlantic mixed species

trap/pot fishery, the Northeast anchored float gillnet fishery, and the Northeast driftnet fishery.<sup>68</sup> The newly-regulated fisheries would be subject to prohibitions on fishing activity in restricted areas. Specifically, fishermen would be prohibited from using gillnet gear inside the Cape Cod Bay Restricted Area from January 1 through May 15, trap/pot gear inside the Great South Channel Restricted Area from April 1 through June 30, or gillnet gear inside the Great South Channel Restricted Gillnet Area from April 1 through June 30.<sup>69</sup>

The closures described above could have a beneficial impact on sea turtles, but such benefits are likely to be limited. Loggerhead and Kemp's ridley sea turtles generally do not appear in the Cape Cod Bay Restricted Area until June, when the closure of the area to gillnet fishing is no longer in effect (NMFS, 2001b). In contrast, the closure of the Great South Channel Restricted Area to other trap/pot fishermen from April 1 through June 30, and the simultaneous closure of the Great South Channel Restricted Gillnet Area to driftnet and anchored float gillnet fishermen, could have a beneficial effect on loggerhead sea turtles, which are occasionally present in the Great South Channel during the month of June. The available data, however, show very little activity by vessels using driftnets, anchored float gillnets, or other trap/pot gear in the Great South Channel at this time. As a result, the benefits of prohibiting such activity are likely to be minor, except to the extent that the prohibition prevents the possible future expansion of driftnet, anchored float gillnet, or other trap/pot fisheries into this area. In addition, it is not likely that these fisheries will shift their fishing effort to areas that are not closed, as fishing activity in this area is already low.

The closures described above could have a beneficial impact on blue, sei, and sperm whales, but such benefits are likely to be limited. Blue and sperm whales are typically not reported in either the Cape Cod Bay Restricted Area or the Great South Channel Restricted Area. Blue whales are most frequently sighted in the waters off eastern Canada, with the majority of recent records from the Gulf of St. Lawrence (Sears et al., 1987). At best, the blue whale is considered an occasional visitor in the U.S. Atlantic EEZ, which may represent the southern limit of its feeding range; however, these waters are still well north of the Restricted Areas identified by the ALWTRP (CETAP, 1982; Wenzel et al., 1988). The distribution of sperm whales in the U.S. Atlantic EEZ occurs on the continental shelf edge, over the continental slope, and into mid-ocean (Waring et al., 2002). Therefore, sperm whales are unlikely to benefit from the fishery closures in Cape Cod Bay and the Great South Channel because of the distinct offshore distribution of this species.

Sei whales, on the other hand, may benefit from the fishery closures described in this section. Although sei whales are often found in the deeper waters characteristic of the continental shelf edge region (Hain et al., 1985), NMFS aerial surveys have found substantial numbers of sei whales in this region, south of Nantucket, in the spring of 2001. The general offshore pattern of sei whale distribution is sometimes disrupted during episodic incursions into

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<sup>68</sup> The Atlantic blue crab trap/pot fishery would also become subject to ALWTRP requirements. This fishery, however, does not extend far enough north to be affected by closure of the restricted areas addressed here.

<sup>69</sup> The prohibition on gillnet fishing in the Great South Channel would apply only to the Great South Channel Restricted Gillnet Area. Gillnet fishing would be allowed year-round in the Great South Channel Sliver Restricted Area. Such activity would be subject to all applicable requirements of the ALWTRP (i.e., Northeast Gillnet Waters requirements).

more shallow and inshore waters (Waring et al., 2003). In addition, sei whales (like right whales) are largely planktivorous, primarily feeding on euphausiids and copepods; this has resulted in reports of sei whales in more inshore locations, such as the Great South Channel (in 1987 and 1989) and Stellwagen Bank (in 1986) (Waring et al., 2003). Therefore, sei whales may benefit from the fishery closures in Cape Cod Bay and the Great South Channel during the periodic incursions into these waters.

For reasons similar to those discussed for blue and sperm whales, the closures described above are likely to offer limited benefits to harbor porpoises, Atlantic white-sided dolphins, pelagic delphinids, bottlenose dolphins, and harbor, gray, and harp seals. The western North Atlantic coastal migratory stock of bottlenose dolphins is generally distributed south of Long Island; thus, fishery closures in Cape Cod Bay and the Great South Channel are unlikely to have a significant impact on entanglement risks for this species. Harbor porpoises, Atlantic white-sided dolphins, and pelagic delphinids, however, are more common in New England waters. To the extent that fishery closures in the Great South Channel and Cape Cod Bay help to reduce overall fishing effort (rather than simply divert it to other areas where these species may also be present), entanglement risks to these species may be reduced.

#### **5.2.1.9 Changes to Exempted Waters**

As previously noted, the ALWTRP currently exempts certain bays, harbors, inlets, and other coastal waters from the provisions of the plan (see Chapter 2). Based on the low probability that whales would be present in these waters, Alternatives 2 through 6 would expand these areas to include all waters landward of the 72 COLREGS demarcation line (International Regulations for Preventing Collisions at Sea, 1972), as depicted or noted on nautical charts published by NOAA (Coast Charts 1:80,000 scale), and as described in 33 CFR part 80, with the exception of Boston Harbor, Gardiners Bay, and portions of the Maine coast, in which NMFS would create a different exemption line (see Chapter 3). This would represent no change in regulations from North Carolina to Florida, but would increase the number of exempted areas from Maine to Virginia.

Expanding exempted areas as described above would primarily affect lobster trap/pot vessels that are currently subject to the ALWTRP requirements for Northern Inshore State Lobster Waters, but might also affect some lobster trap/pot vessels that are currently subject to ALWTRP requirements for Southern Nearshore Waters. Expanding the exempted areas could also affect gillnet vessels that are currently subject to ALWTRP requirements for the Other Northeast Gillnet Waters Area, as well as vessels that are currently subject to ALWTRP requirements for the Mid-Atlantic Coastal Waters Area. The requirements currently in place in these areas are as follows:

- **Northern Inshore State Lobster Waters** – Lobster trap/pot gear must comply with universal gear modification requirements and one option from the Lobster Take Reduction Technology List (all groundlines made entirely of sinking and/or neutrally buoyant line; all buoy lines made entirely of sinking and/or neutrally buoyant line; or all buoys attached to

the buoy line with a weak link having a maximum breaking strength of 600 pounds).

- **Southern Nearshore Lobster Waters** – Lobster trap/pot gear must comply with universal gear modification requirements and all buoys must be attached to the buoy line with a weak link having a maximum breaking strength of 600 pounds.
- **Other Northeast Gillnet Waters** – Anchored gillnet gear that is subject to ALWTRP regulations must comply with universal gear modification requirements; all buoy lines must be attached to the main buoy with a weak link having a maximum breaking strength of 1,100 pounds; all net panels must contain weak links with a maximum breaking strength of 1,100 pounds in the center of the floatline; and anchored gillnet strings of 20 or fewer net panels must comply with minimum anchoring or weighting standards (see Chapter 2 for details).
- **Mid-Atlantic Coastal Waters Area** – Anchored gillnet gear that is subject to ALWTRP regulations must comply with universal gear modification requirements; all buoy lines must be attached to the main buoy with a weak link having a maximum breaking strength of 1,100 pounds; all net panels must contain weak links with a maximum breaking strength of 1,100 pounds in the center of the floatline of each 50-fathom net panel in a net string, or every 25 fathoms for longer panels; and gillnets must return to port with the vessel or be anchored at each end with an anchor having at least the holding power of a 22-pound Danforth-style anchor.

Blue, sei, and sperm whales are not expected to be impacted by this measure, as these species are not known to occur in these areas. As previously discussed, several of these requirements (e.g., weak link provisions) are unlikely to provide any ancillary benefit to smaller protected species, such as sea turtles, bottlenose dolphins, Atlantic white-sided dolphins, Risso's dolphins, pelagic delphinids, harbor porpoises, or harbor, gray and harp seals; however, universal gear modification requirements or the use of sinking and/or neutrally buoyant groundline or buoy line could afford such benefits. Thus, relative to the status quo, relieving previously regulated vessels from these requirements could have an adverse impact on other protected species that may occur in exempted waters. The potential for adverse effects may be greatest for sea turtles. Loggerhead and Kemp's ridley turtles prefer inshore waters and embayments for foraging on crustaceans and mollusks (NMFS, 2001b). Leatherbacks may also swim into shallow waters if there is an abundance of jellyfish nearshore. For example, leatherbacks are reportedly present in Buzzard's Bay during the summer and fall months (NMFS, 2001d); this is one of the areas that would be newly exempted from ALWTRP requirements under Alternatives 2 through 6.

The practical impact of the potential change in exempted waters is unclear, since data on the number of vessels that currently fish in exempted waters are unavailable. In some areas, however, existing ALWTRP regulations extend to virtually all state waters. This is the case, for example, in Maine, where the only waters currently exempt from ALWTRP requirements are those landward of the first bridge over an embayment, harbor, or inlet. It is reasonable to

assume, therefore, that relatively few vessels currently fishing in Maine waters are exempt from ALWTRP requirements. In comparison, spatial analysis suggests that approximately half of the more than 3,700 lobster vessels fishing in Maine state waters would be exempt from ALWTRP requirements under Alternatives 2 through 6.<sup>70</sup> Thus, the expansion of exempted waters in this state would likely affect a relatively large number of vessels, which in turn could have an adverse impact on other protected species, particularly leatherbacks. There currently is no evidence of interactions between Kemp's ridleys or green turtles and lobster trap/pot gear, and very limited information about interactions between loggerheads and lobster trap/pot gear. The magnitude of the impact on these species would depend upon the gear modifications that such vessels have already implemented but would no longer be required to maintain. If these vessels have relied primarily upon weak links to comply with ALWTRP requirements – as seems likely – the impact of removing these requirements is likely to be negligible.<sup>71</sup> Conversely, if these vessels have met ALWTRP standards by switching to sinking and/or neutrally buoyant buoy line or groundline, the impact of exempting them from these standards could be greater.<sup>72</sup> In addition, leatherback, Kemp's ridley, and loggerhead turtles commonly occur in Mid-Atlantic waters; many inshore embayments, harbors, and inlets are already exempt from the ALWTRP regulations. However, Delaware Bay is currently exempted landward of a line that extends from the southern point of Nantuxent Cove, New Jersey to the southern end of Kelly Island, Port Mahon, Delaware. Under Alternatives 2 through 6, NMFS proposes to exempt waters landward of the 72 COLREGS demarcation line for Delaware Bay, thus exempting the entire Bay from the ALWTRP regulations. This action may adversely affect loggerheads, as more gillnet vessels may choose not to return their nets to port. However, this effect may be minor if these fishermen currently leave their gear in the water.

#### **5.2.1.10 Deep Water Exemptions**

As previously described, Alternatives 2 through 6 would expand the areas subject to a non-floating groundline requirement, in most cases making the use of sinking and/or neutrally buoyant groundline mandatory on a seasonal or year-round basis in all waters covered by the

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<sup>70</sup> See Appendix 6-G for further information on the estimated percentage of lobster trap/pot vessels in Maine waters that would not be subject to ALWTRP requirements under Alternatives 2 through 6. It is important to note that the impact of the expansion of exempted waters is likely to be greater in Maine than in other states, both because of the large number of vessels that fish in Maine waters and because the percentage of such waters that are currently exempt is low.

<sup>71</sup> The economic analysis presented in Chapter 6 assumes that lobster vessels fishing in Northern Inshore State Lobster Waters currently rely on the weak link option from the Lobster Technology Take Reduction List to comply with ALWTRP requirements (i.e., all buoys attached to the buoy line with a weak link having a maximum breaking strength of 600 pounds). This option is likely to be the least expensive to implement, and is unlikely to increase gear loss. In contrast, the remaining options on the list – all groundlines made entirely of sinking and/or neutrally buoyant line, or all buoy lines made entirely of sinking and/or neutrally buoyant line – are more costly to implement and could have an adverse effect on gear loss, particularly in Maine waters, where hard bottom conditions predominate.

<sup>72</sup> The discussion above focuses on the impacts of expanding exempted waters assuming that a significant number of fishermen might choose to fish exclusively within those waters, thus avoiding the need to comply with ALWTRP requirements. It is possible that fishermen would choose to modify their gear to comply with ALWTRP requirements in non-exempt waters, and would use the same gear in exempt areas. To the extent this occurred, the potential for any adverse impact on other protected species would be reduced.

ALWTRP. Each of these alternatives, however, would provide an exemption for gear that is fished at depths greater than 280 fathoms. As explained below, this exemption is unlikely to have an adverse impact on entanglement risks.

This exemption is unlikely to have an adverse impact on the risk that other protected species would become entangled in commercial fishing gear. With the possible exception of some sea turtles and sperm whales, the species discussed in this section are not commonly known to dive to such depths. As a result, the use of floating groundline at depths greater than 280 fathoms should pose them no risk.

#### **5.2.1.11 Extension of SAM and DAM Programs to Additional Fisheries**

As previously described, Alternatives 2 through 6 would expand the scope of the ALWTRP to include the Atlantic mixed species trap/pot fishery and the Northeast anchored float gillnet fishery.<sup>73</sup> Under Alternatives 2, 3 (Preferred), and 4, these fisheries would be subject to the requirements of the SAM and DAM programs until 2008, when both programs would be eliminated. Under Alternative 5, these fisheries would become subject to the requirements of the expanded SAM program (the DAM program would be eliminated six months following promulgation of the rule). Finally, under Alternative 6 (Preferred), these fisheries would be subject to the requirements of the expanded SAM program until 2008, when the program would be eliminated (the DAM program would be eliminated six months following promulgation of the rule). In quantifiable terms, an additional 25 vessels would be regulated under the expansion of the SAM zone under Alternatives 5 and 6 compared to Alternatives 1 through 4 (see Exhibit 5-1 in section 5.1.3.2). Under Alternatives 2 through 4, approximately 265 additional vessels would be regulated under the DAM program compared with the No Action Alternative (Alternative 1). No additional vessels would be regulated under the DAM program under Alternatives 5 and 6 since it would be eliminated six months after promulgation of the rule.

Regulation of additional fisheries under the SAM and DAM programs would likely have a beneficial effect on other protected species if they are present in these areas during the times when the SAM program and DAM zones are in effect. Although the designation of SAM and DAM areas is based solely on the distribution and abundance of right whales, other protected species may be in the vicinity when SAM and DAM measures are required. If this is the case, SAM and DAM measures that are designed to reduce large whale entanglement risks (e.g., the required use of sinking and/or neutrally buoyant buoy line and groundline) may also serve to reduce entanglement risks for other protected species. As described above, Alternatives 2, 3 (Preferred), 4, and 6 (Preferred) would eliminate the DAM program no later than 2008, and would also eliminate the SAM program at the start of that year. In these cases, however, the SAM and/or DAM programs would be replaced by a broad-based gear modification program. In the interim, the gear modifications that the SAM and DAM programs would require could

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<sup>73</sup> The Northeast driftnet fishery and the Atlantic blue crab trap/pot fishery would also become subject to ALWTRP requirements, but the former would not be subject to the SAM or DAM programs. The Atlantic blue crab trap/pot fishery would be subject to SAM and DAM requirements, but does not extend far enough north to be affected by the SAM program. Given its location (centered primarily in Chesapeake Bay), it is also unlikely to be affected by the DAM program.

benefit other protected species, with impacts similar to those described in the relevant sections above. Other protected species may be adversely affected when a DAM is triggered if fishing effort shifts to areas where these species occur.

#### 5.2.1.12 Seasonal Regulation of Southeast and Mid-Atlantic Waters

As previously noted, a fundamental difference among the regulatory alternatives under consideration is the extent to which broad-based gear modification requirements – i.e., sinking and/or neutrally buoyant groundline requirements, requirements concerning the use of multiple weak links in gillnet panels, and minimum gillnet anchoring requirements – would be established for fisheries in Mid-Atlantic and Southeast waters. Alternative 5 would establish no such broad-based requirements, while Alternative 2 would establish these requirements year-round in both the Mid-Atlantic and Southeast. Alternatives 3 (Preferred) and 6 (Preferred) would also extend broad-based gear modification requirements to the Mid-Atlantic and Southeast, but would only do so on a seasonal basis: from September 1 through May 31 in the Mid-Atlantic, from November 15 through April 15 between the South Carolina/Georgia border and 29°00' N latitude, and from December 1 through March 31 in waters south of 29°00' N. In contrast, Alternative 4 would establish year-round gear modification requirements in the Mid-Atlantic, but would require them on a seasonal basis in the Southeast: from November 15 through April 15 between the South Carolina/Georgia border and 29°00' N latitude, and from December 1 through March 31 in waters south of 29°00' N.<sup>74</sup>

Quantitative risk reduction indicators reflect this seasonal variation. For example, the number of trips subject to broad-based gear modifications in addition to the status quo (Alternative 1, No Action) for Alternative 2 is approximately 51,702, followed by 51,305 trips under Alternative 4 (see Exhibit 5-11). For Alternatives 3 (Preferred) and 6 (Preferred), the number of trips subject to broad-based gear modifications is approximately 48,439.

The application of broad-based gear modification requirements on a seasonal basis in Mid-Atlantic and/or Southeast waters, as envisioned under Alternatives 3 (Preferred), 4, and 6 (Preferred), is unlikely to have an adverse effect on the entanglement risks *currently* faced by other protected species, since the seasonal variation in requirements would pertain only to the implementation of new standards.<sup>75</sup> Looking forward, the implementation of year-round rather than seasonal requirements would offer greater ancillary benefits to these species. Under Alternative 2, for example, broad-based gear modification requirements would be in effect year-round; thus, protected species that inhabit Mid-Atlantic or Southeast waters year-round, such as bottlenose dolphins and pelagic delphinids, would receive the benefits of these requirements throughout the year. This would not be the case under Alternatives 3 (Preferred), 4, or 6

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<sup>74</sup> The southern boundary of the southernmost area subject to ALWTRP requirements would be set at 27°51' N for trap/pot and Southeast gillnet fisheries, and at 26°46.5' N for shark net fisheries.

<sup>75</sup> The ranges of the WNA stocks of blue whales, Atlantic white-sided dolphins, harbor, gray, and harp seals, sei whales (Nova Scotian stock), sperm whales (North Atlantic stock), and harbor porpoises (Gulf of Maine/Bay of Fundy stock) are typically well north of the of the Southeast and Mid-Atlantic waters; thus, these requirements would be unlikely to affect these species (Waring et al., 2000, 2002, and 2003).

(Preferred). Similarly, Alternative 2 would afford ancillary benefits to sea turtles migrating northward through the Mid-Atlantic from April through June. In contrast, Alternative 3 (Preferred) and Alternative 6 (Preferred) would only require the implementation of broad-based gear modifications through the end of May; thus, turtles migrating through the Mid-Atlantic in June would receive no additional protection. These alternatives, however, would afford sea turtles ancillary protection during their southward migration, which typically begins in September and concludes in the late fall; during this period, broad-based gear modification requirements would be in effect throughout the Mid-Atlantic. Such requirements would also be in effect in the Southeast from mid-November through mid-April, when turtle abundance in the area is highest.<sup>76</sup>

## **5.2.2 Impacts to Essential Fish Habitat**

As noted in Chapter 4, using the types of fixed fishing gear regulated under the ALWTRP (i.e., traps/pots and anchored gillnets) can affect essential fish habitat primarily through their impacts on the benthic environment. Such impacts generally arise as a result of contact between fishing gear and the sea floor, which, in some cases, can alter the physical structure of the seabed, injure or kill benthic organisms, alter the structure and productivity of the benthic community, contribute to the suspension of sediments, and cause changes in the chemical composition of the water column overlying affected sediments. In addition, the loss of fixed gear and subsequent “ghost fishing” may have adverse impacts on the structure of marine communities. Lost gear may not only continue to fish, but may contribute to secondary habitat loss by becoming mobilized during storms and damaging delicate bottom communities.

The regulatory alternatives under consideration are likely to have minimal to no impact on the benthic environment. The regulatory provisions with the greatest potential to affect benthic habitat are those that may influence contact between ALWTRP-regulated gear and the sea floor. As discussed below, the provisions of interest are those pertaining to exempted waters and to groundline, weak link, and gear anchoring requirements.

### **5.2.2.1 Exempted Waters**

As described above, Alternatives 2 through 6 would expand the area of coastal waters that would be exempted from ALWTRP requirements. This change, coupled with an increase in regulatory requirements in other areas, might create an incentive for fishermen to relocate their effort to exempted waters. If this were to occur, it would increase stress on the benthic environment in these areas.<sup>77</sup> Any relocation of effort, however, is likely to be limited by other

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<sup>76</sup> It is possible that fishermen who modified their gear to comply with seasonal requirements would also use that gear when the requirements are not in effect. To the extent this occurred, it would provide an ancillary benefit to other protected species.

<sup>77</sup> This change presumably would be offset by a decrease in fishing pressure in other areas, with potentially beneficial implications for benthic habitat in these areas.



factors, including the already crowded conditions in inshore and nearshore waters and the conflicts between fishermen that could arise if those who attempted to relocate their effort were perceived as encroaching on territory unofficially claimed by others. As a result, any adverse impact on the essential fish habitat in exempted waters is likely to be limited.

#### **5.2.2.2 Groundline Requirements**

With the exception of Alternative 1 (No Action), all of the regulatory alternatives under consideration would require increased use of sinking and/or neutrally buoyant groundline. The use of such line rather than floating line will increase the line's contact with the sea floor, creating the potential for adverse impacts on benthic habitat. Such impacts, however, are likely to be minimal and temporary, since line would not be set in any one location for an extended period of time. A possible exception could occur in the Southeast, where impacts on coral and other benthic organisms are of particular concern. From this perspective, alternatives that would minimize impacts on benthic environments in the Southeast – such as Alternative 5, which imposes no sinking and/or neutrally buoyant groundline requirement in the Southeast, or Alternatives 3 (Preferred), 4, and 6 (Preferred), which impose this requirement only seasonally – would be preferable to Alternative 2, which imposes a sinking and/or neutrally buoyant groundline requirement year-round.

#### **5.2.2.3 Weak Link and Anchoring Requirements**

The increased use of weak links, as required by regulatory Alternatives 2 through 6, is unlikely to have a significant impact on essential fish habitat. It is possible, however, that weak links could benefit essential fish habitat by reducing the likelihood that an entangled whale would drag gear over sensitive areas. Instead, the weak link is expected to break, releasing the gear. To the extent this occurs, potential damage to the marine environment could be avoided.

The gillnet anchoring requirements under consideration could have some adverse impact as a result of the contact between an anchor and the sea floor. Such impacts, however, would be minimal and temporary since an anchor would only be set at a specific location for a short period of time. There is also little risk that entangled whales would drag anchors and consequently damage habitat because weak links are expected to release the anchor if a whale became entangled.

### **5.2.3 Impacts to Directed Catch and Bycatch**

Like other regulations on commercial fishing, changes in ALWTRP requirements could have an impact on directed catch and bycatch in affected fisheries. Directed catch refers to the catch of species targeted by the fisheries currently or potentially subject to ALWTRP requirements (see list of affected fisheries in Chapter 4.2). Under the Magnuson-Stevens Fishery Conservation and Management Act, bycatch is defined as the harvest of fish that are not sold or kept for personal use, including economic and regulatory discards.

As described below, potential changes to the ALWTRP are unlikely to have a significant impact on directed catch or bycatch. The discussion is divided into three parts:

- Impacts associated with major gear modification requirements;
- Impacts associated with seasonal closures of newly regulated fisheries in restricted areas; and
- Impacts associated with changes to exempted waters in the Northeast and Mid-Atlantic.

#### **5.2.3.1 Major Gear Modification Requirements**

None of the major gear modification requirements specified under Alternatives 2 through 6 are likely to have a significant impact on directed catch or bycatch. The NMFS Gear Research Team reports that no significant changes in catch have been observed by or reported to them for any of the gear modifications currently required under the ALWTRP. The gear modification requirements envisioned under Alternatives 2 through 6 primarily involve the extension of such requirements to additional fisheries and/or new areas. Given the nature of the changes envisioned and experience with such requirements to date, no significant change in directed catch or bycatch is anticipated.

As previously discussed and as summarized in detail in Exhibit 5-12, several major gear modification requirements, such as those pertaining to the use of sinking and/or neutrally buoyant groundline, have the potential to increase or decrease the loss of commercial fishing gear. To the extent that these changes occur, they could alter the effects of ghost fishing, with subsequent impacts on directed catch. While overall impacts are not expected to be significant, the potential for adverse impacts is greatest under Alternative 2, which requires the use of sinking and/or neutrally buoyant groundline in ALWTRP-regulated waters year-round. The potential for adverse impacts on directed catch would diminish under Alternative 4, which would make the use of sinking and/or neutrally buoyant groundline a seasonal requirement in the Southeast, and would diminish further under Alternatives 3 (Preferred) and 6 (Preferred), which would make the use of sinking and/or neutrally buoyant groundline a seasonal requirement in both the Mid-Atlantic and Southeast. The potential for adverse impacts would be further reduced under Alternative 5, which would require the use of sinking and/or neutrally buoyant groundline under the expanded SAM program, but would not impose a broad-based requirement for its use in other areas. In addition, both Alternative 5 and Alternative 6 (Preferred) would remove SAM buoy line requirements that have an adverse impact on gear loss within six months of promulgation of new regulations; in contrast, Alternatives 2 through 4 would leave these requirements in place until 2008, thus increasing the possibility that lost gear would have an adverse impact on directed catch.

#### **5.2.3.2 New Fishery Closures in Restricted Areas**

With the exception of Alternative 1 (No Action), each of the regulatory alternatives under consideration would expand the scope of the ALWTRP to include the Atlantic mixed species trap/pot fishery, the Northeast anchored float gillnet fishery, and the Northeast driftnet fishery.<sup>78</sup> The newly-regulated fisheries would be subject to prohibitions on fishing activity in restricted areas. Specifically, fishermen would be prohibited from using gillnet gear inside the Cape Cod Bay Restricted Area from January 1 through May 15, trap/pot gear inside the Great South Channel Restricted Area from April 1 through June 30, or gillnet gear inside the Great South Channel Restricted Gillnet Area from April 1 through June 30.<sup>79</sup> The available data on these fisheries, however, show very little activity in Cape Cod Bay or the Great South Channel when the restrictions would be in effect. As a result, new restrictions on these fisheries would likely have minimal impact on their directed catch or bycatch.

### 5.2.3.3 Changes to Exempted Waters

As discussed above, Alternatives 2 through 6 would expand the waters that are specifically exempted from ALWTRP requirements. If vessels relocated their effort to these exempted areas in order to avoid the costs of complying with ALWTRP requirements, more directed catch and bycatch in these waters could occur. As a result of this increased fishing pressure, stocks of both targeted and bycatch species in these waters could be adversely affected.

## 5.2.4 Summary of Impacts

As the discussion above suggests, there is no significant difference among Alternatives 2 through 6 with respect to impacts on essential fish habitat, directed catch, or bycatch; in each case, the impact is expected to be minimal. In contrast, these alternatives differ with respect to the ancillary benefits they afford other protected species. The differences among these alternatives stem from differences in the extent to which they would mandate broad-based gear modifications, such as the use of sinking and/or neutrally buoyant groundline. Under Alternative 5, for example, many broad-based gear modification requirements would not be imposed; as a result, ancillary benefits to other protected species would be limited primarily to those associated with the expansion of SAM requirements to additional fisheries and additional areas. Under

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<sup>78</sup> The Atlantic blue crab trap/pot fishery would also become subject to ALWTRP requirements. This fishery, however, does not extend far enough north to be affected by the closures of the restricted areas addressed here.

<sup>79</sup> The prohibition on gillnet fishing in Great South Channel would apply only to the Great South Channel Restricted Gillnet Area. Gillnet fishing would be permitted year-round in the Great South Channel Sliver Restricted Area. Such activity would be subject to all applicable requirements of the ALWTRP (i.e., Northeast Gillnet Waters requirements).

Alternative 2, however, broad-based gear modification requirements would be in effect in all ALWTRP-regulated waters at all times; thus, protected species that inhabit Mid-Atlantic or Southeast waters year-round, such as bottlenose dolphins, would benefit from these requirements throughout the year.

The alternatives that would establish broad-based gear modification requirements on a seasonal basis – Alternatives 3 (Preferred), 4, or 6 (Preferred) – would vary with respect to the ancillary benefits they provide other protected species. Alternative 4, for example, would afford ancillary benefits to sea turtles migrating northward through the Mid-Atlantic from April through June. In contrast, Alternative 3 (Preferred) and Alternative 6 (Preferred) would only require the implementation of broad-based gear modifications through the end of May; thus, turtles migrating through the Mid-Atlantic in June would receive no additional protection. All of these alternatives, however, would afford sea turtles ancillary protection during their southward migration, which typically begins in September and concludes in the late fall; during this period, broad-based gear modification requirements would be in effect throughout the Mid-Atlantic. Such requirements would also be in effect in the Southeast from mid-November through mid-April, when turtle abundance in the area is highest.

With the exception of Alternative 1 (No Action), all of the regulatory alternatives under consideration would expand the area of coastal waters that would be exempted from ALWTRP requirements. This change would relieve previously regulated vessels from ALWTRP requirements, and thus could have an adverse impact on other protected species relative to the status quo. The practical impact of the potential change in exempted waters is unclear, since data on the number of vessels that currently fish in exempted waters are unavailable. Expansion of exempted waters in certain areas (e.g., Maine) could affect a relatively large number of vessels; however, the impact on other protected species would depend upon the gear modifications that such vessels have already implemented but would no longer be required to maintain. If these vessels have relied primarily upon weak links to comply with ALWTRP requirements – as seems likely – the impact of removing these requirements is likely to be negligible. Conversely, if these vessels have met ALWTRP standards by switching to sinking and/or neutrally buoyant buoy line or groundline, the impact of exempting them from these standards could be greater.<sup>80</sup>

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<sup>80</sup> The discussion above focuses on the impacts of expanding exempted waters assuming that a significant number of fishermen might choose to fish exclusively within those waters, thus avoiding the need to comply with ALWTRP requirements. It is possible that fishermen would choose to modify their gear to comply with ALWTRP requirements in non-exempt waters, and would use the same gear in exempt areas. To the extent this occurred, the potential for any adverse impact on other protected species would be reduced.

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